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Abstract

We study regulatory enforcement actions issued against US banks to show that both board monitoring and advising are effective in preventing misconduct by banks. While better monitoring by boards prevents all categories of misconduct, better advising prevents misconduct of a technical nature. Board monitoring increases the likelihood that misconduct is detected, increases the penalties imposed on the CEO and alleviates shareholder wealth losses following the detection of misconduct by regulators. Our paper offers novel insights on how to structure bank boards to prevent bank misconduct.

JEL Classifications: G20, G30, K20
Key words: banks**,** enforcement actions, board monitoring, board advising, misconduct

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1. Introduction

The reputation of banks for professional and ethical conduct is in sharp decline. Over recent years, regulators have taken record numbers of enforcement actions against banks to require them to take corrective measures against misconduct. Among the banks engulfed in misconduct cases are various high-profile institutions. For instance, JPMorgan has faced several enforcement actions related to credit card fraud, money laundering and internal accounting controls over the past few years.[1] Misconduct cases are costly to bank investors with the fines imposed often outweighed by substantial reputational losses for offending banks. There are also concerns that repeated instances of misconduct erode public confidence in the safety and soundness of the banking sector. What banks can do to prevent misconduct is therefore an important question. Arguably, a bank's board of directors, in its capacity to monitor and advise the CEO (Adams and Ferreira, 2007; Fama and Jensen, 1983), should play a key role in the implementation and oversight of controls to mitigate the risk of misconduct.[2] The purpose of this paper is to test this assertion. Specifically, we examine whether the two key functions of bank boards, monitoring and advising, are effective in preventing misconduct by banks. We use regulatory enforcement actions against banks to identify banks that engage in misconduct.

In some ways, the recent surge in bank misconduct cases is surprising. One explanation for misconduct holds that when a CEO has too much authority within the firm, misconduct is but

[1] "OCC to hit JPMorgan Chase With Enforcement Actions", Dow Jones, 14 January 2013.

[2] Regulators increasingly see boards as key to shaping a bank's risk culture with a view to preventing misconduct. Recent regulatory guidelines issued by the Office of the Comptroller of the Currency (2014) establish 'heighted expectations' of the role of the board in ensuring that banks operate in a safe and sound manner. Similar expectations of the role of bank boards are expressed by the Financial Stability Board (2014).

one potential outcome (Khanna et al., 2015). However, by most accounts, oversight of CEO decision-making has improved markedly in recent years. Data from Riskmetrics show that eight out of ten members of US bank boards are classified as independent in 2012, up from around half in 2000. With increasing levels of independence, one would expect bank boards to be more effective in preventing misconduct. However, far from a declining trend, the number of enforcement actions has increased from 5 to 28 over the same time period.

The rise in bank misconduct cases under increasingly more independent boards is consistent with the view that true board independence is difficult to achieve (e.g., Coles et al., 2014; Lee et al., 2014). Board independence can be undermined if CEOs exert intangible influence over those charged with monitoring them. One way in which a CEO could yield intangible influence is by capturing the board through director appointments (Khanna et al., 2015). Since the CEO is typically involved in the process of recommending directors to the board, directors appointed during the tenure of the current CEO have an incentive to return the favor (Coles et al., 2014; Khanna et al., 2015). Even independent directors may reciprocate the CEO's requests and agree to side with the CEO to support, engage in or conceal wrongdoing. Following this line of argument, only directors appointed before the current CEO's tenure are free from this type of intangible influence and are therefore capable of objectively monitoring the CEO. In this paper, we measure the quality of board monitoring using the fraction of directors who are appointed before the current CEO takes office (*Monitoring Quality*).

In addition to monitoring, boards also advise the CEO. Advice is critical because CEOs may not always possess the knowledge and skills required to make decisions that lower instances of wrongdoing. Since the banking sector is complex and skill-intensive (Philippon and Reshef, 2012), bank CEOs may be prone to missteps in the absence of technical expertise. Therefore,

boards with the capability to advise effectively could assist CEOs in making better decisions and thus play a crucial role in reducing instances of bank misconduct. We proxy for the quality of board advice using the connections that a director has with directors at other firms at any given time (*Advising Quality)*. We focus on director connections because connections arise when a director has qualities that make them valuable to many firms (Coles et al., 2012). Demand for director services arises from a director's ability to provide useful advice, information or contacts. Furthermore, connected directors have better access to information which would allow them to offer higher-quality advice to the CEO.

To identify bank misconduct, we employ a unique dataset of regulatory enforcement actions issued by the three US supervisory bodies (the Federal Reserve Board (FRB), the Federal Deposit Insurance Corporation (FDIC) and the Office of the Comptroller of the Currency (OCC)) against banks that engage in unsafe, unsound and illegal banking practices which violate laws. One concern with our analysis is that we can only observe detected misconduct (once an enforcement action has been issued), but not the population of all committed cases of misconduct. That is, even in the absence of enforcement actions, a bank may still have engaged in undetected misconduct. To address this problem of partial observability, we follow Wang (2013) and Wang et al. (2010) to employ a bivariate probit model that disentangles committing misconduct from the detection of misconduct conditional upon misconduct having occurred.

We find that a bank in which *Monitoring Quality* is high (all directors have been appointed before the CEO takes office) has a 27% lower probability of committing misconduct and a 35% higher probability of detection (conditional upon misconduct having occurred) than a bank where all directors have been appointed under the current CEO. Further, a one-standard-deviation increase in *Advising Quality* reduces the likelihood that misconduct is committed by

11% and increases the likelihood of detection by 7%. Our results are robust to two-stage instrumental variable (IV) analysis that circumvents endogeneity concerns by exploiting the role of the local labor market in supplying directors to a bank. Specifically, we use the distance from a bank's headquarters to the nearest airport and the population of the county where a bank is headquartered as sources of exogenous variation in our measures of board monitoring and advice. In brief, we argue that banks in remote locations will see higher director turnover and struggle to recruit directors of high advising capability. Further, in all specifications, we control for the proportion of independent directors and the number of directors with financial expertise. We find that these traditional measures of board monitoring and advising have little or no power to prevent bank misconduct.

We are able to rule out alternative economic interpretations of our results. First, one may argue that our measure of board monitoring quality captures the effect of CEO tenure. We address this by constructing *Residual Monitoring Quality* as the residual from a regression of *Monitoring Quality* on CEO tenure. Our results continue to hold when using residual monitoring, which removes any correlation between *Monitoring Quality* and CEO tenure. Second, our monitoring measure may capture director experience as longer-tenured directors are less likely to have been appointed by the current CEO. As with CEO tenure, we construct *Residual Monitoring Quality* as the residual from a regression of *Monitoring Quality* on average board tenure. Our results remain robust to using this alternative measure of monitoring quality. Third, our monitoring measure is robust to controlling for director's career concerns (Gibbons and Murphy, 1992), board busyness (Fich and Shivdasani, 2006) and for the quality of board advising. Finally, and perhaps most importantly, our measure of board advising quality is distinct from monitoring quality, as demonstrated at various points throughout this study.

How do board monitoring and advising prevent bank misconduct? We study two channels that help explain the results. First, many enforcement actions are issued when bank fundamentals indicate increased bank risk. Our results show that better monitoring and advising prevent enforcement actions because these boards are associated with higher bank capital cushions, lower portfolio risk and fewer non-performing loans. Second, CEOs will be deterred from committing wrongdoing if they know ex ante that a board will penalize them for instances of misconduct. We find that boards that are not captured by the CEO are more willing to impose heavier penalties on the CEO following detected misconduct. That is, after misconduct is detected, better *Monitoring Quality* is associated with a larger reduction in (i) the level of CEO pay, (ii) the level of CEO pay relative to the other top executives at the same bank (the CEO pay slice), and (iii) the value of CEO risk-taking incentives.[3] In contrast, *Advising Quality* does not affect CEO discipline, consistent with our argument that *Advising Quality* is distinct from and unrelated to *Monitoring Quality*.

Finally, we examine whether the stock market reaction to bank misconduct is affected by our measures of board quality. We find a positive relation between the announcement returns and board quality, implying that effective boards are associated with less severe fraud. Thus, effective boards not only reduce the likelihood of wrongdoing, but they also alleviate shareholder wealth losses upon announcements of wrongdoing.

This paper makes several important contributions. First, our work is related to the debate on governance and risk-taking in the banking industry (Adams and Ragunathan, 2013; Beltratti and Stulz, 2012; Ellul and Yerramilli, 2013; Minton et al., 2014). We contribute to this literature

[3] The finding of a reduced CEO pay slice is of particular significance because it indicates that, by disciplining CEOs relative to other bank executives, boards hold CEOs at least in part responsible for misconduct.

by providing the first empirical work that studies the effectiveness of bank boards in preventing enforcement actions in the banking sector. Relative to other bank risk measures studied in the literature, enforcement actions provide a suitable identification of the effectiveness of internal governance. This is because enforcement actions provide an unambiguous external indicator of undesirable conduct in the industry. Further, since regulators determine enforcement, the degree of enforcement varies exogenously across banks. Additionally, our empirical approach allows us to elicit the specific mechanisms through which corporate governance affects misconduct tendency in banking.

Second, our paper contributes to the literature on the determinants and economics of corporate misconduct. Previous work has linked misconduct to a lack of monitoring by the board (Agrawal and Chadha, 2005; Beasley, 1996; Chidambaran et al., 2012; Hegde and Zhou, 2014; Khanna et al., 2015), outside investors (Wang et al., 2010) or various other parties (Dyck et al., 2010; Kedia and Rajgopal, 2011). We contribute to this literature by identifying the role of advising in explaining misconduct. We find that while monitoring is required to deter all sorts of misconduct, advising plays a clear role in preventing misconduct of a more technical nature.

Finally, we contribute to the literature on the role and design of corporate boards (e.g., Adams et al., 2010; Coles et al., 2012, 2014; Field et al., 2013; Minton et al., 2014). The key question in this literature is whether boards matter for firm outcomes, and if they do, which particular board functions matter. We present the first empirical study that simultaneously considers the effects of board monitoring and advising. Our results on how board monitoring and advising jointly and differentially affect misconduct are new to the literature.

2. Research Design

2.1 HYPOTHESIS DEVELOPMENT

Fama and Jensen (1983) and Adams and Ferreira (2007) posit that directors monitor and advise the CEO to help align the interests between managers and shareholders and to maximize shareholder value. Since corporate misconduct can potentially destroy shareholder value on a large scale (Karpoff et al., 2008a), we conjecture that an effective board of directors, in its capacity to monitor and advise the CEO, should also play a key role in mitigating the risk of misconduct.

2.1.1 Board monitoring quality and bank misconduct

It is well-established that in the absence of tight monitoring from the board, CEOs may have incentives to commit wrongdoing to conceal private benefits (Dechow et al., 2010; Jensen and Meckling 1976; Stein, 1989). Such benefits could involve higher compensation or non-financial benefits such as greater publicity or empire building. Thus, a board of directors that is independent from the CEO is needed to monitor and discipline the CEO to curb managerial misbehavior (e.g., Agrawal and Chadha, 2005; Beasley, 1996).

We hypothesize that boards that are not psychologically captured by the CEO are more willing to monitor the CEO and that this will prevent misconduct. Our hypothesis is grounded in social influence theory, which posits that individuals rely on principles of reciprocity, a nearly universal code of moral conduct, when making decisions (Gouldner, 1960). The theory suggests that most people exhibit a psychological aversion to over-benefiting or under-benefiting from social relationships (Fehr and Schmidt, 1999). This implies that when employees believe they receive help in their appointments to a position of corporate influence, they will be motivated to

return the favor to avoid the psychological distress created by over-benefiting from a relationship.

As the CEO is typically involved in appointing and recommending directors to the board, directors appointed by the CEO tend to feel indebted to her and thus have a natural tendency to return the favor (Coles et al., 2014; Khanna et al., 2015; Landier et al., 2013). Consistent with this, Hermalin and Weisbach (1998) specify in their model of CEO bargaining with the board that directors develop a natural aversion to monitoring because the opportunity cost of director's time can be high. Consequently, the reciprocity fostered through appointment decisions helps directors to justify their aversion to monitoring (see also, e.g. Coles et al., 2014). This creates an environment conducive to misconduct, makes detection of misconduct difficult and reduces a CEO's expected costs of committing misconduct. We therefore predict that directors appointed before the current CEO are psychologically independent and in a position to objectively monitor the CEO in a way that prevents wrongdoing. We call the fraction of board directors appointed before the current CEO *Monitoring Quality*. We hypothesize:

Hypothesis 1: *Monitoring Quality reduces the likelihood of bank misconduct.*

2.1.2 Board advising quality and bank misconduct

Our second hypothesis relates board advising to bank misconduct. While early studies suggest that boards monitor and give advice to the CEO (e.g., Mace, 1971), the focus of much subsequent study has been on the monitoring role of the board (see Coles et al., 2014; Hermalin

and Weisbach, 1998; Weisbach, 1988).[4] While Coles et al. (2012) offer one of the first studies into the value of board advice by showing that complex firms benefit from greater advice, more recent studies emphasize the role of board advice for firms with minimal experience in public markets (Field et al., 2013) and firms operating in innovative industries (Dass et al., 2014).

We hypothesize that better board advice prevents corporate misconduct. This is because some CEOs may lack the expertise to make certain informed decisions and misconduct cases may occur when CEOs are unaware of the (il)legality of a certain activity (Khanna et al., 2015). In banks, some CEOs may lack the technical expertise to effectively oversee regulatory provisioning and reserve requirements—and breaches of either could result in regulatory enforcement actions. We, therefore, argue that a board with a higher capability to give advice to the CEO will facilitate more informed decision-making and prevent incidences of misconduct.

We use director connections as an indicator of board advising. Fama and Jensen (1983) suggest that connections signal director quality because in a competitive labor market only high-quality directors hold multiple board appointments. Brickley et al. (1998), Fich and Shivdasani (2007), Kaplan and Reishus (1990) and others show that high quality directors serve on a greater number of boards. In addition, better-connected directors are likely to have had experience with a variety of issues that firms face and can lever their network to access better information (e.g., Cohen et al., 2008; Coles et al., 2012; Field et al., 2013). Hence, better-connected directors should be better advisors to the CEO and provide the information, perspectives, and technical expertise to the CEO to help avoid wrongdoing. We define *Advising Quality* as the total number

[4] Hermalin and Weisbach (1998) acknowledge that "one limitation of our model is that it focuses solely on the monitoring role of boards. The institutional literature emphasizes that boards also play important roles providing information and advice to management" (p. 112).

of directors to whom board members on the board are collectively connected, scaled by board size. We hypothesize:

Hypothesis 2: *Advising Quality reduces the likelihood of bank misconduct*

2.2 SAMPLE CONSTRUCTION

We gather data on regulatory enforcement actions issued by the three main US banking supervisory authorities (FDIC, FRB and OCC) for the period 2000–2013 from SNL Financial.[5] Our sample encompasses all severe enforcement actions, including (1) Formal agreements, (2) Cease and desist orders and (3) Prompt corrective actions.[6]

In the next step, we obtain all banks with accounting data from commercial bank and bank holding company data (FFIEC 031/041 and FR Y-9C). To allow for a lag structure in our dataset, our sample period is from 1999 to 2012. We then obtain market data from the Center for

[5] Enforcement is a key tool that regulators use to ensure that banks maintain safe and sound practices (Delis and Staikouras, 2011). Typically, regulators conduct on-site examinations to ensure that bank operations are consistent with sound banking practices. When on-site examinations reveal unsound or illegal banking practices, regulators will make an informal enquiry to the bank management. This gives the bank the opportunity to justify their practices. The regulator will only issue an enforcement action when there is substantial evidence of misconduct. Therefore, one advantage of using regulatory enforcement actions to identify banks that engage in misconduct is that there is a very low chance of misdetection and thus a low chance of misidentifying banks engaged in misconduct.

[6] *Formal (written) agreements* are agreements between the bank and the regulator that set out details on how to correct conditions that provide the basis for the agreement. *Cease and desist orders* prohibit the bank from engaging in certain banking activities. They also require the bank to take corrective actions to improve on areas that provide the basis for the order. *Prompt corrective actions* are imposed on undercapitalized banks. They require the bank to restore adequate levels of capital and demand submission of a capital restoration plan within a predetermined period.

Research in Securities Price (CRSP) and corporate governance data from the BoardEx database and match them with our Call Reports sample.

We then match the name, city and state of each bank that received enforcement actions to our panel dataset. This results in a matched sample of 311 enforcement actions. We then use Factiva to search for newspaper articles reporting the news of the enforcement action and screen each to ensure that we have correctly attributed the enforcement action to a particular bank. If there are multiple enforcement actions relating to a single case of misconduct, we group them together so that only one case is identified. Our final sample contains 4,072 bank-year observations of 533 unique banks and 244 enforcement actions.

[Table I around here]

Table I provides descriptive statistics on the enforcement action sample. It shows that enforcement actions were taken against banks in every year with a surge following the 2007 global financial crisis. We demonstrate in the Internet Appendix that the results we report are not dependent on the time period analyzed in this paper and equally hold before 2007. Table I also shows that our sample is very comprehensive. The sample contains nearly 80% of all enforcement actions (nearly 95% by bank size) issued against listed US banks during our sampling period.

2.3 EMPIRICAL DESIGN

Empirical research on corporate misconduct faces an inherent challenge, namely that misconduct is not observed until it has been detected. This means the outcome we observe is the product of two processes: the commission of misconduct and the detection of misconduct. As long as detection is not perfect, we do not observe every instance of misconduct that has been

committed. To address this partial observability problem, we follow Wang (2013) and Wang et al. (2010) and use the bivariate probit model. The theoretical foundation of this model is drawn from Becker's (1968) economic approach to crime. It can be implied from the model that an individual's probability of committing fraud increases with the expected payoffs and decreases with its expected cost (from getting detected and penalized). Thus, the probability committing misconduct is determined by two sets of variables. The first set is derived from the expected benefit of committing fraud. The second set of variables is related to the expected cost of committing fraud, which essentially depends on the probability of detection.

In addition, there are factors that are related to both the probability to commit misconduct and to detect misconduct, for example, a board of directors that is not willing to monitor the CEO, and therefore should be included in both equations. However, there are factors that affect the likelihood that misconduct is detected but not a bank's incentives to commit wrongdoing. Likewise, there are factors that incentivize misconduct but do not affect the likelihood that misconduct is detected. The bivariate probit model relies on this intuition to separate fraud detection from commission processes. Let M_{it} and D_{it} represent whether bank i commits wrongdoing in year t and whether the misconduct is detected, respectively:

$$M_{it}^* = X_{M,\,it}\,\beta_M + \mu_{it} \tag{1}$$

$$D_{it}^* = X_{D,\,it}\,\beta_D + \nu_{it} \tag{2}$$

$X_{M,\,it}$ is a vector of variables that explain firm i's incentives to commit misconduct in year t, and $X_{D,\,it}$ is a vector of variables that explain firm i's likelihood of getting caught. μ_{it} and ν_{it} are zero-mean disturbances with a bivariate normal distribution.

We denote $M_{it} = 1$ if $M_{it}^* > 0$ and $M_{it} = 0$ otherwise. We denote $D_{it} = 1$ if $D_{it}^* > 0$, and $D_{it} = 0$ otherwise. We do not directly observe the realizations of M_{it} and D_{it}. However, we can

observe the following: $Z_{it} = M_{it} \times D_{it}$ where $Z_{it} = 1$ if bank i engages in misconduct and this is detected, and $Z_{it} = 0$ if bank i does not commit wrongdoing or commits wrongdoing but this has not been detected.

Let Φ denote the bivariate standard normal cumulative distribution function. ρ is the correlation between μ_{it} and ν_{it} from (1) and (2). Then:

$$P(Z_{it} = 1) = P(M_{it} D_{it} = 1) = P(M_{it} = 1, D_{it} = 1) = \Phi(X_{M,it}\beta_M, X_{D,it}\beta_D, \rho), \quad (3)$$

$$P(Z_{it} = 0) = P(M_{it} D_{it} = 0) = P(M_{it} = 0, D_{it} = 0) + P(M_{it} = 1, D_{it} = 0)$$

$$= 1 - \Phi(X_{M,it}\beta_M, X_{D,it}\beta_D, \rho) \quad (4)$$

Thus, the log likelihood for the model is:

$$L(\beta_M, \beta_D, \rho) = \Sigma \log(P(Z_{it} = 1)) + \Sigma \log(P(Z_{it} = 0)) \quad (5)$$

The bivariate model can be estimated using the maximum-likelihood method. According to Poirier (1980), an important feature of this approach is that $X_{M,it}$ and $X_{D,it}$ do not contain the same set of variables such that there is at least one vector that has one or more variables absent in the other vector (see also Wang (2013), Wang et al. (2010)). We detail the variables included in both vectors in Section 2.4.2.

2.4 VARIABLES

2.4.1 Board quality: monitoring and advising

Monitoring Quality. We capture board monitoring quality using the number of board members appointed before the current CEO takes office. We refer to such members as "non-captured" board members.[7] We define the variable as:

$$Monitoring\ Quality = \frac{\#non-captured\ board\ members}{Board\ size - 1} \tag{6}$$

The denominator is the total number of directors sitting on the board less the CEO as she always sits on the board in our sample. This variable ranges from 0 to 1, with higher values indicating a board that is not captured by the CEO and thus is more willing to independently monitor the CEO. The average *Monitoring Quality* in our sample is 0.54. Thus, in our sample, half of the board is not captured by the CEO. We use BoardEx to construct *Monitoring Quality*. BoardEx provides biographic data of more than 60,000 unique directors serving at over 70,000 private, public and not-for-profit companies.

For robustness, we also construct the alternative measure *Residual Monitoring Quality*, which is defined as the residual from a regression of *Monitoring Quality* on CEO tenure. This variable will remove the positive correlation between *CEO tenure* and *Monitoring Quality*. Thus, it isolates the board monitoring effect from the effect of CEO tenure.

[7] To construct this variable, we compare the start of the employment date of the board member and date the CEO takes office. When the CEO leaves and then gets re-appointed, we do not reset tenure to zero but add on the pre-departure tenure.

Advising Quality. We use the number of directors to whom existing board members of a given bank are connected to proxy for the ability of the board to advise the CEO. Following Coles et al. (2012), we define the variable as:

$$Advising\ Quality = \frac{\#directors\ to\ whom\ board\ members\ are\ connected}{Board\ size} \tag{7}$$

For each board member of a given bank, we count the number of directors in other firms that this member is connected to by serving as co-directors. We then sum across all board members of this bank and then divide this sum by the size of the board to obtain *Advising Quality*. The average *Advising Quality* in our sample is 1.81. The correlation between *Monitoring Quality* and *Advising Quality* is 0.01 confirming that the two are distinct measures that proxy for different board functions.[8]

[8] However, one could still argue that *Advising Quality* captures other aspects of board monitoring that are unrelated to *Monitoring Quality*. To completely rule out this possibility, we examine the effects of *Advising Quality* on CEO turnover and CEO compensation policies, which are part of a board's monitoring activities. We find that *Advising Quality* does not have any measurable effect on (i) CEO turnover-performance sensitivity, (ii) the level of CEO pay, (iii) the level of CEO pay relative to other top executives at the same bank (the CEO pay slice), and (iv) the value of CEO risk-taking incentives. This confirms our argument that *Advising Quality* is not associated with the monitoring of the CEO. In contrast, consistent with Coles, Daniel, and Naveen (2014), we find that *Monitoring Quality* is significantly related to CEO turnover-performance sensitivity and various CEO compensation policies. The results are available upon request.

2.4.2 Control variables

Estimating the bivariate model requires two sets of control variables, one set designed to explain the commission of misconduct and the other for detection of misconduct. The variables are chosen based on the existing theoretical and empirical work in the corporate fraud literature (Khanna et al., 2015; Wang, 2013; Wang et al., 2010).

Commission of misconduct regressions

Our baseline specification for the latent equation for banks committing misconduct is as follows:

$$M_{it}^{*} = \mathbf{X}_{M,\,it}\,\beta_M + \mathbf{X}_{MD,\,it}\,\gamma_M + \mu_{it} \qquad (8)$$

$\mathbf{X}_{M,\,it}$ contains a set of variables that previous studies have shown to influence a bank's incentives to commit wrongdoing but not the likelihood that the wrongdoing is detected. $\mathbf{X}_{MD,\,it}$ contains a set of factors that affect the bank's incentives to commit wrongdoing and also the likelihood of detection.

$\mathbf{X}_{M,\,it}$ includes the bank's profitability, leverage and investor beliefs about industry prospects. CEOs of poorly performing or financially distressed banks could be more likely to commit wrongdoing to inflate earnings. We control for bank profitability using the ratio of earnings before interest and tax divided by total assets (*ROA*) and leverage using the ratio of total liabilities to total assets. In addition, Wang et al. (2010) show that misconduct is related to investor beliefs about industry prospects and find a non-linear relation with industry charter value. Hence, we include *Industry charter value* and *(Industry charter value)*^{2} in the misconduct commission equation. Industry charter value is measured as the median charter value in a given year.

$\mathbf{X}_{MD,\,it}$ contains other bank-level measures such as size, risk, growth prospects, board-level monitoring proxies and CEO characteristics. We control for bank size using the natural logarithm of the book value of total assets. Furthermore, Povel et al. (2007) argue that CEOs of high-growth firms that exhibit a downturn are more likely to commit wrongdoing. Thus, we control for the bank's charter value using the ratio of market value of equity divided by the book value of equity (*Charter value*) and the percentage of change in bank assets over the prior year (*Asset growth*). The corporate fraud literature also suggests that a firm's risk could be related to a firm's tendency to commit wrongdoing. Thus, we control for a bank's portfolio risk using the ratio of risk-weighted assets to total assets.

Board characteristics: We control for various board monitoring proxies, such as the number of directors on the board (*Board size*) and the fraction of independent directors (*Board independence)*. We also include the ratio of independent directors with prior experience as a CFO or a finance director (*Board financial expertise*). The monitoring role by independent directors has been widely documented in the fraud literature (e.g., Beasley, 1996). Furthermore, directors with relevant expertise could offer timely advice to the CEO and could therefore play an important advising role (Agrawal and Chadha, 2005).

Further, Hermalin and Weisbach (1998) suggest another reason for directors' aversion to monitoring is because their career is tied to the CEO. Hence, we control for directors' career concerns to demonstrate that the results based on our measure of monitoring quality are not driven by directors' career concerns. We proxy for career concerns using the average age of

directors on the board (*Ln(Board age)*) since career concerns should be stronger when a worker is further away from retirement (Gibbons and Murphy, 1992).[9]

Finally, for better-connected directors to be able to lever their network to access better information and be better advisors to the CEO, board networks should be "good" in the sense that they should not involve connections to firms engaged in misconduct. Otherwise, board connections could be used to foster rather than to prevent misconduct. To control for the quality of director networks, we compute the aggregate connections that board members have to firms that were involved in a misconduct case in the past 10 years. We call the resulting variable *Exposure to misconduct*.[10]

CEO characteristics: Our controls for CEO characteristics include the number of years the CEO has served in this position (*Ln(CEO tenure*)) and whether the CEO also chairs the board (*CEO is chair*). We control for CEO tenure throughout the paper to demonstrate that the results based on our measure of monitoring quality are not driven by CEO tenure. We control for *CEO is chair* as CEOs who chair the board may block the information flow to board members and hence reduce the quality of board oversight (Fama and Jensen, 1983).

CEO pay: A number of papers link fraud to the compensation of executives (e.g. Johnson et al., 2009). CEOs may be incentivized to commit wrongdoing to manipulate short-term

[9] For robustness, we use two alternative measures of career concerns in addition to board age and report the results in the Internet Appendix.

[10] We use a database of accounting fraud cases, namely, the SEC's Accounting and Auditing Enforcement Releases (AAERs) to identify misconduct amongst financials and non-financial firms. The database provides detailed information on more than 1,300 cases of accounting misconduct involving banks and non-financials between 1982 and 2013. In robustness tests (Internet Appendix), we use cartel cases as an alternative measure of misconduct and report qualitatively similar results.

performance to enjoy higher payouts. We control for the bonus component of CEO pay, measured as CEO bonus divided by total compensation. We also control for the equity incentives embedded in CEO compensation. The sensitivity of CEO wealth to bank risk (*vega*) measures the changes of CEO wealth to stock return volatility. If misconduct increases equity risk, this means that CEOs with higher *vega* will have an incentive to engage in riskier projects, including those involving wrongdoing. By contrast, the sensitivity of CEO wealth to bank performance (*delta*) measures changes in CEO wealth to stock price performance. Because delta exposes a CEO's wealth also to falling stock prices, a higher *delta* might discourage CEOs from committing wrongdoing. Since CEOs will be interested in the relative impact of both *vega* and *delta* on their wealth before deciding to commit wrongdoing, we scale vega by delta (*CEO vega/delta*).[11]

Top executive characteristics: Bank wrongdoing could directly relate to a range of observable characteristics of top executives. We compute the fraction of top 5 executives with a degree from an Ivy League institution (% *Ivy League executives*), an MBA degree (% *MBA degree*), or military experience (% *Military executives*). Chidambaran et al. (2012) show that CEOs attending an Ivy League university are less likely to commit fraud. Benmelech and Frydman (2015) argue that military-trained CEOs tend to have more conservative corporate policies and ethical principles. Hence, we infer from the findings that military-trained executives are less likely to commit wrongdoing.

[11] We are grateful to Jeffery Coles, Naveen Daniel and Lalitha Naveen for sharing their data on CEO equity-based incentives online. Please refer to Coles, Daniel and Naveen (2006) and Core and Guay (2002) for detailed calculation of the variables.

Regulators: We control for the main regulator that supervises the bank. We include two dummies: *OCC* (equals 1 if the bank is overseen by the OCC) and *FRB* (equals 1 if the bank is overseen by the FRB).

Detection of misconduct regressions

$$D_{it}^{*} = \mathbf{X}_{MD,\,it}\,\delta_D + \mathbf{X}_{D,\,it}\,\beta_D + \nu_{it} \quad (9)$$

As illustrated above, the vector $\mathbf{X}_{MD,\,it}$ contains variables that influence both misconduct commission and detection processes.

However, certain factors trigger the detection of misconduct while unrelated to the causes of banks committing misconduct. This is true for factors that cannot be anticipated by the CEO at the time when misconduct is committed. For example, a sudden drop in performance is difficult to predict for CEOs, but this performance drop may trigger additional regulatory scrutiny of banks and thus contribute to misconduct being detected. We identify a vector $\mathbf{X}_{D,\,it}$ which includes variables that affect detection but are exogenous to a bank's ex ante incentives to commit wrongdoing. Following Wang (2013), we include *Abnormal ROA, Adverse stock return, Abnormal return volatility* and *Abnormal stock turnover* in this vector.

[Table II around here]

To capture *Abnormal ROA* performance relative to recent past performance, we compute the residuals (ε_{it}) from the following model for each bank: $ROA_{\,it} = \beta_0 + \beta_1 ROA_{it-1} + \beta_2 ROA_{it-2} + \varepsilon_{it}$. *Adverse stock return* is a dummy variable that equals 1 if the bank's stock return is in the bottom 10% of all the bank-year return observations in the CRSP database. In addition, the bank's stock return volatility and stock turnover could also trigger detection by regulators. We

measure *Abnormal return volatility* as the demeaned standard deviation of daily stock returns in a given year and *Abnormal stock turnover* as the demeaned daily stock turnover in a given year.

Finally, we include year dummies in all regression specifications in the paper to control for the general economic environment. Table II provides summary statistics for the variables that we use in our analysis.

3. Bank Boards and Bank Misconduct

3.1 MAIN RESULTS

Table III reports our bivariate probit estimation regression results. Odd-numbered columns report prediction results for banks committing misconduct [P(M=1)]; even-numbered columns show the prediction results for banks that were detected to have committed misconduct, conditional upon misconduct having been committed [P(D=1|M=1)].

[Table III around here]

The coefficients of our key variables of interest, *Monitoring Quality* and *Advising Quality*, are statistically significant. Effective board monitoring and advising are associated with fewer cases of committed misconduct and more cases of detected misconduct. The results are economically significant. The estimated coefficient of *Monitoring Quality* suggests that a bank with all directors appointed before the CEO taking office (*Monitoring Quality* = 1) has a 27% lower probability of wrongdoing commission and a 35% higher probability of detection than a bank with no director appointed before the CEO taking office (*Monitoring Quality* = 0). A one-standard-deviation increase in *Advising Quality* is associated with 11% lower probability of wrongdoing and 7% higher probability of detection.

The control variables have the expected signs. Most interestingly, board independence does not enter significantly. This indicates that the current standard for director independence, which mostly focuses on the absence of economic ties between directors and a firm, fails to prevent misconduct. We also find that banks with greater exposure to firms that have engaged in misconduct have a higher likelihood of committing misconduct and a lower likelihood of misconduct detection. This confirms that network quality plays an important role in preventing misconduct. Further, powerful CEOs, as proxied by CEO is chair, are less likely to be detected and are associated with a higher probability of committing misconduct. Surprisingly, we find that younger boards are associated with fewer misconduct cases. This could be because younger boards are more concerned about reputational damage (and diminished opportunities for new employment) if they gain a reputation as ineffective monitors.

The variables excluded from the detection equation but included in the commission equation (*Abnormal ROA, Adverse stock return* and *Abnormal stock volatility*) show the expected signs and are statistically significant. An F-test of joint significance of *Abnormal ROA, Adverse stock return*, *Abnormal stock volatility* and *Abnormal stock turnover* (F-stats = 62.81; Prob > Chi^2 = 0.000) indicates that they are jointly significant. Likewise, the variables excluded from the commission equation are also individually and jointly significant.

Section 6 presents numerous robustness tests which show that our results are robust using a standard probit regression, the pre-2008 period only, board monitoring and advising by independent directors only, as well as various alternative tests.

3.2 CEO CHARACTERISTICS AND BANK MISCONDUCT

An alternative explanation for the results we report above could be that CEOs with certain characteristics, such as greater talent or industry experience, may be more attracted to work for more connected boards. Thus, the lower misconduct likelihood associated with effective board advising could be due to CEO characteristics rather than board advising. This section shows that our main results remain robust to the inclusion of variables that measure CEO pay, shareholder ownership, education and military background.

[Table IV around here]

The first two columns of Table IV report the estimates between CEO pay and misconduct commission and detection, respectively. We find that *CEO Bonus/total compensation* and *CEO vega/delta* are positively related to the probability that misconduct is committed. The positive link between CEO bonus payment and wrongdoing is consistent with our argument that CEOs commit wrongdoing in order to boost stock prices and enjoy higher payouts.

Columns (3) and (4) control for the personal characteristics of top executives. We find that executives attending elite universities (*% Ivy League Executives*) are less likely to commit wrongdoing which is consistent with these executives having greater skills and abilities. Alternatively, they could have greater concerns for their career and reputation (Chidambaran et al., 2012). Executives with an MBA degree or military training have no effect on wrongdoing.

3.3 RESULTS FOR DIFFERENT CLASSES OF ENFORCEMENT ACTIONS

While we find that effective boards reduce wrongdoing, it is unclear whether this reduction holds for different types of misconduct. For instance, effective board advising could be particularly relevant in reducing technical types of misconduct where advising via the board will be

particularly important to inform CEO decision-making. To verify this, we classify enforcement actions according to how technical the underlying violation is. We examine the newspaper coverage and the websites of bank supervisory authorities to gather information on the exact violation(s) that have given rise to an enforcement action. We classify misconduct cases as technical if the enforcement action has been caused by violations of requirements concerning capital adequacy and liquidity, asset quality, lending, provisions and reserves. We classify misconduct cases as non-technical if the enforcement actions are related to failures of a bank's internal control and audit systems, risk management systems, and anti-money laundering systems. Non-technical misconduct cases also include breaches of the requirements concerning the competency of the senior management team and the board of directors as well as violations of various laws such as consumer compliance programs, Federal Trade Commission Act (FTCA), Equal Credit Opportunity Act (ECOA). [12] Panel A of Table V shows the summary statistics of the two enforcement action types.

[Table V around here]

Consistent with our expectation, Panel B of Table V shows that *Advising Quality* reduces technical types of misconduct (such as violations of capital requirements or substandard asset quality) but has no measurable effect on non-technical types of misconduct. This reaffirms that our measure of board advising is different from board monitoring. Thus, consistent with previous literature (Coles et al., 2012; Field et al., 2013), our results indicate that board advising matters

[12] While we cannot rule out that certain technical and non-technical types of misconduct could be functional to each other, we can demonstrate that these two types of misconduct capture largely unrelated types of behavior. We find the correlation between the two types to be 0.02 (not statistically significant). To further ensure that our results are not driven by cases in which both types of enforcement actions occur, we exclude banks that receive both types of enforcement actions during our sample period. The results of this untabulated test do not alter our main findings.

more when the demand for director advice is high. On the other hand, *Monitoring Quality* matters to both types of misconduct.

We show that board advising matters most to misconduct of a technical nature. We take the analysis further by narrowing down the definition of the *Advising Quality* proxy and re-estimate this relation. Our baseline definition of *Advising Quality* is the number of directors to whom the directors on the board are collectively connected, scaled by the size of the board. This assumes that every director has equal knowledge regardless of the industry in which the director is working. However, it is possible that a director serving on the board of a firm in an industry related to banking has better access to information and will be in a better position to offer relevant advice to the CEO. Furthermore, the director is likely to encounter similar technical issues confronting the board, such as setting the level of capital requirements. Hence, we construct a new measure of board advising: *Industry Connections.* This is defined as the connections that arise only from serving on boards in the following industries: insurance, investment companies, life assurance and private equity.[13] Our second measure of advising is *Large Firm Connections*, which is based on the connections arising from serving on boards of large firms, where large means total assets above the sample median. Directors who serve on the board of a large firm have to deal with a wide range of issues facing the board and therefore could be able to offer better advice to the CEO (Coles et al., 2012).

Panel C reports the estimated relations between alternative proxies of board advising and technical-related misconduct. For comparison purposes, columns (1) and (2) report our baseline results using the original definition of *Advising Quality* while Columns (3) and (4) report the

[13] BoardEx has a variable called "Sector" which classifies firms into different industry sectors. The analysis shown in this test relies on the BoardEx definition of industry sector.

results using *Industry Connections* and (5) and (6) report *Large Firm Connections*. All coefficients are statistically significant. Most interestingly, Columns (1) and (3) reveal that the magnitude of *Industry Connections* is twice as large as that of our baseline measure (the difference is statistically significant). The results indicate that directors whose connections arise from firms in a related industry are able to offer high-quality advice to the CEO, providing further support to our hypothesis that board advising matters to misconduct.

Overall, our findings demonstrate that boards with higher advising capacity could assist the CEO in making more accurate and better-informed decisions, thereby decreasing instances of wrongdoing.

3.4 ENDOGENEITY OF BOARD MEASURES

Identifying causality between our two board measures and bank misconduct poses some challenges. In particular, banks of a certain board composition could either attract or select CEOs who are more likely to commit misconduct. It is possible, for instance, that CEOs intent on committing misconduct choose to work for banks with ineffective boards. Further, while we control for a range of board and CEO characteristics, it is still possible that unobservable firm characteristics affect both director selection and the occurrence of misconduct at the same time. For instance, a bank's corporate culture may be such that it makes misconduct more likely and may also attract a certain type of CEO who is more likely to engage in misconduct.

To circumvent these endogeneity concerns, we exploit the role of the local labor market in supplying directors to a bank. Specifically, we construct two instrumental variables (IVs) that are related to *Monitoring Quality* and *Advising Quality* but are not related to misconduct. The first instrument is the distance from a bank's headquarters to the nearest airport (*Ln(Distance*

Airport)). Geographic coordinates are obtained from the US Census file. The second instrument is the population of the county of the bank's headquarters (*Ln(Population)*). County information is obtained through COMPUSTAT and the population information comes from the US Census Bureau.

Both instruments are related to *Monitoring Quality* because they both affect the rate of director turnover. Arguably, directors are likely to eschew remotely located banks, that is, banks headquartered further away from an airport, in favor of more conveniently located banks. We would therefore expect higher director turnover in remote bank locations as directors leave these banks for more conveniently located institutions. Higher director turnover results in more director appointments and thus in lower *Monitoring Quality* at remotely located banks. Equally, both instruments affect *Advising Quality* because banks in locations with better access to an airport and banks located in more populous areas should have access to a larger labor market. Since the supply of qualified directors is limited and their recruitment is time-consuming (Knyazeva et al., 2013), more convenient bank locations will make it more likely that banks are able to recruit qualified directors with high advising capabilities. *Advising Quality* should thus be higher for more conveniently located banks.

Importantly, neither the distance to the next airport nor the population of the county of a bank's headquarters should be related to bank misconduct other than through the effect the instruments have on board composition. The Federal Deposit Insurance Corporate Improvement Act of 1991 (FDICIA) puts in place the basis for a consistent intensity of enforcement across the US by requiring that each bank be examined by federal regulators as least once every 12

months.[14] In addition, our data confirm that the enforcement intensity does not vary between urban and rural areas.[15]

[Table VI around here]

The first-stage estimation results are reported in Table VI, columns (1), (2), (5) and (6). Specifications (1) and (5) are for the commission equation while specifications (2) and (6) are for the detection equation. We run two first-stage regressions for *Monitoring Quality* and *Advising Quality*. As expected, *Monitoring Quality* decreases with the distance from a bank's headquarters to the nearest airport and *Advising Quality* increases with the county's population.

The second-stage regression results are reported in specifications (3), (4), (7) and (8). The coefficients on our IV estimates are statistically significant and larger than those of OLS estimates. A potential explanation for this difference is that not accounting for endogeneity would bias the coefficients of *Monitoring Quality* and *Advising Quality* in OLS toward zero (Theil, 1971). This problem can be mitigated by the instrumental variable approach. Overall, we interpret these results as showing that our measures of board quality are causally related to misconduct in banking.

[14] Some banks may qualify for a lower supervision frequency of 18 months if it is safe and sound and its total assets are below $500 million. This should not be a concern because there are less than 10% of banks in our sample falls into this category.

[15] As in Degryse and Ongena (2005), we define counties as urban if the population is more than 250,000 and as rural otherwise. We calculate *enforcement intensity* as the number of enforcement actions issued divided by the number of banks. The *enforcement intensity* is 0.38 and 0.33 for urban and rural areas, respectively and this difference is not statistically significant at customary levels. Under the assumption that misconduct is not location-related other than through the effect the instruments have on board composition, we interpret this as showing that *enforcement intensity* is uniform across the country.

4. How Do Boards Reduce Enforcement Actions?

In this section, we explore two specific channels through which boards can reduce bank misconduct cases. We examine whether boards that are more effective monitors and advisors could be associated with (i) lower bank risk or (ii) improved managerial discipline.

4.1 REDUCTION IN BANK RISK

Many cases of technical misconduct are issued when bank fundamentals indicate increased risk. Thus, effective boards could reduce technical misconduct by reducing a bank's risk measures. We analyze three risk indicators: Tier-1 capital, portfolio risk and the fraction of non-performing loans. Tier-1 capital is a core measure of a bank's financial strength from a regulatory point of view. Commercial banks exert discretion over the level of capital as long as it is above the minimum capital. In addition, we also examine portfolio risk and the fraction of non-performing loans as both are important causes of enforcement actions. Table VII reports the relation between *Monitoring Quality* and *Advising Quality* and measures of risk.

[Table VII around here]

After controlling for bank and other board characteristics, both *Monitoring Quality* and *Advising Quality* are positively related to Tier-1 capital. A one-standard-deviation increase in the percentage of non-captured board members and connected board members is associated with a 21-basis-point and an 12-basis-point improvement in the bank's Tier-1 capital, respectively. In addition, we find a negative relation between *Monitoring Quality* and the bank's portfolio risk (as measured by the proportion of risk-weighted assets on a bank's balance sheet) and the fraction of non-performing loans. Overall, the results in Table VII indicate that both board monitoring and board advising are associated with safer banks and, hence, reduce the instances of technical misconduct.

4.2 MANAGERIAL DISCIPLINE

CEOs are likely to consider the personal costs of committing wrongdoing before they engage in it (Khanna et al., 2015). There are several ways in which the CEOs could be disciplined following the detection of misconduct. CEOs may lose their reputation and their job, and in some cases may face criminal charges (Karpoff et al., 2008b). Among these possible consequences, some are determined by the courts, some by the labor market and some by the board.

One of the key monitoring functions of the board is to evaluate and discipline the CEO (Mace, 1971). We would expect that boards that are not captured by the CEO will impose heavier penalties on the CEO if wrongdoing is detected. We consider four ways in which boards could discipline CEOs: (1) dismissal, (2) reductions in pay, (3) reductions in pay relative to other top executives, and (4) reductions in contractual risk-taking incentives (*CEO vega*).[16] These variables are measured one year after the enforcement action takes place.

Table VIII reports the regressions of our board measures on measures of CEO discipline. $Misconduct_{t-1}$ is equal to 1 if wrongdoing is detected during the previous year. *Misconduct* relates detected wrongdoing to the CEO's penalties via an interaction with *Monitoring Quality*. Therefore, the coefficient of the interaction term measures the penalties the CEO has to bear after wrongdoing is detected and when board monitoring is high.

[Table VIII around here]

Panel A of Table VIII displays our key estimation results. Odd-numbered columns omit the interaction terms while even-numbered columns display the full set of variables. As shown in

[16] We are only interested in CEO *vega* but not CEO *delta* because *vega* gives the CEO a clear incentive to commit wrongdoing while *delta* has an ambiguous effect on wrongdoing. Thus, boards would be interested in modifying the *vega* component following wrongdoing discovery.

the odd-numbered columns, *Misconduct* is not significant in any specification. On average, a regulatory enforcement action does not lead to CEOs being disciplined. However, the interaction term between *Misconduct* and *Monitoring Quality* indicates that following misconduct under higher board monitoring quality, CEOs are disciplined in the following ways: CEOs receive (i) a larger pay cut, (ii) a reduced pay slice relative to other top executives at the same bank and (iii) lower contractual risk-taking incentives (*CEO vega*). It is interesting to note that our results on pay slice show that the reduction in CEO pay following misconduct is not due to executive pay having been reduced for all executives, but that CEO pay has been reduced relative to other executives. Evidently, boards view the CEO as the key person holding responsibility for misconduct and therefore reduce the CEO salary relative to the salaries of other executives.

Panel B of Table VIII displays the results of tests that interact *Misconduct* with *Advising Quality*. *Advising Quality* should not have an effect on how CEOs get disciplined following misconduct. Consistent with this, none of the interaction terms enter the regression significantly. This validates our interpretation of *Advising Quality* capturing the ability of the board to give advice rather than to monitor the CEO.

Our results have two key implications. First, non-captured directors discipline the CEO after wrongdoing is detected, thus increasing the CEO's costs of wrongdoing. This could act as an ex ante deterrent to the CEO to engage in wrongdoing and could explain why our earlier analysis shows that effective board monitoring reduces the probability that banks engage in misconduct. Second, in the absence of a board that engages in effective monitoring, regulatory enforcement actions have little impact on CEOs being disciplined. These results add novel insights to the CEO's disciplinary mechanisms in the banking sector (Schaeck et al., 2012). In banks, not only shareholders but regulators are also involved in monitoring and therefore play a

role in the CEO's disciplinary process. Consistent with this, our results indicate that regulatory action alone does not discipline bank CEOs, but a combination of the two – effective board monitoring and enforcement action – can create the desired effects.

5. Does Better Board Quality Alleviate Shareholder Wealth Losses?

In the previous sections, we show how effective boards reduce the likelihood of bank misconduct. We now test whether effective boards also reduce the severity of misconduct. Consistent with the prior literature, we capture the severity of misconduct using the abnormal stock price reaction to the announcement of misconduct (e.g. Cumming et al., 2015).

We expect to find a positive relationship between the announcement returns and measures of board monitoring and advising. Since high-quality boards are more effective at preventing misconduct, detected cases of misconduct are likely to be less severe. Assuming that the wrongdoing that is detected in *t* is likely to have been committed in *t-1*, we expect lagged board variables to be linked with higher announcement returns.[17] Further, effective boards are more likely to take corrective action, such as disciplining the CEO and "fixing" the bank after wrongdoing has been detected. Thus, investors may be more positive about misconduct when the current board exhibits high monitoring or advising quality. Thus, we also include contemporaneous measures of monitoring and advising in our analysis.

[Table IX around here]

We use event study methodology to test these hypotheses. To find the announcement date, we search newspapers using the Factiva database and define the event day as the earliest

[17] Our results are robust to alternative time gaps between the commission and detection of misconduct. We find qualitatively identical results if the gap is two or three years.

trading day when the news of the enforcement action is made public. We drop several observations where there are missing stock returns or when other major corporate news is released on the same day. This yields a sample of 206 announcements. We then estimate a market model using a value-weighted CRSP index as a market index from 46 to 146 days before the announcement of an enforcement action. We construct cumulative abnormal returns (CARs) as the sum of the prediction errors of the market model.

The average CARs over a three-day [-1, +1] event window is -3.50%, (significant difference at the 1% level). This shows that regulatory enforcement actions hurt shareholder wealth. The dependent variables are CARs of three-day window [-1, +1]. Table IX displays our regression results. Columns (1) and (2) show that the announcement returns are positively related to measures of *Monitoring Quality* when wrongdoing is committed (*t*-1) as well as when it is detected (*t*). The coefficients are also economically significant. CARs are on average 6% higher when the board has all directors appointed before the CEO's tenure than when none are appointed before the current CEO's tenure. Thus, effective board monitoring reduces the severity of the misconduct. Further, investors expect an effective board to take action to help the bank recover from the misconduct as shown by a significant coefficient on contemporaneous measures of *Monitoring Quality*. This lends support to our prior finding that following enforcement action, a board with effective monitoring capability will discipline the CEO. Finally, Columns (3) and (4) show that *Advising Quality* does not enter the regression significantly.

6. Internet Appendix: Robustness tests on the relation between board effectiveness and bank misconduct

In this section, we test the robustness of our key results using alternative definitions of our board measures. The results are included in an internet appendix to this paper.

6.1 Is Monitoring Quality driven by CEO tenure?

Monitoring Quality correlates with CEO tenure as longer-tenured CEOs will have been able to appoint a larger fraction of directors. Thus, our measure of monitoring quality may capture the effects associated with long CEO tenure instead of effective board monitoring. We show that our results are not affected by CEO tenure as follows.

First, we control for CEO tenure in all specifications in the analysis above. Second, we compute *Residual Monitoring Quality* as the residual from a regression of *Monitoring Quality* on CEO tenure. This variable is free of any positive correlation between CEO tenure and *Monitoring Quality.* As indicated in the Internet Appendix A.I., our results are robust using our modified measure of *Monitoring Quality* that strips out the effect of tenure.

6.2 Is Monitoring Quality driven by director experience?

Another possibility is that our *Monitoring Quality* correlates with director tenure, and thus reflects the experience of directors. Directors who are not captured by the CEO tend to have longer board tenure. We use two different approaches to deal with this concern.

First, we control for average board tenure. Second, as with CEO tenure, we estimate the residual from a regression of *Monitoring Quality* on average board tenure. Our results are robust to using this modified measure of monitoring as indicated in the Internet Appendix A.II.

6.3 Is Monitoring Quality capturing director's career concerns?

In the analysis above, we use board age to control for director career concerns. In this section, we use two alternative measures of career concerns and show that controlling for these does not alter our main findings.

First, we include the fraction of board members who are younger than 65. Second, we include the fraction of board members whose current appointment at the bank is their first and only directorship. These directorships should be particularly valuable to directors thus raising their career concerns and turning them into more effective monitors. As shown in the Internet Appendix A.III., *Monitoring Quality* continues to enter significantly after controlling for these alternative proxies of directors' career concerns.

6.4 Is Advising Quality different from board busyness?

Fich and Shivdasani (2006) define a board to be "busy" if more than half of the outside directors on a board hold three or more directorships. While a board does not need to be "busy" to have high *Advising Quality*, we could expect a positive correlation between these two measures. Thus, *Advising Quality* may capture the effects of a busy board instead of effective advising quality. We define *Board busyness* similar to Fich and Shivdasani (2006) and perform two tests to show that the effects we obtain for *Advising Quality* are not driven by *Board busyness*.

As shown in the Internet Appendix A.IV., Board busyness does not explain bank misconduct. First, we include both *Advising Quality* and *Board busyness* in the bivariate probit model. The coefficients of *Board busyness* are insignificant in both the commission and detection equations while the coefficients of *Advising Quality* remain significant. Second, we

repeat the analysis by including only *Board busyness* but not *Advising Quality*. Again, none of the coefficients are significant.

6.5 Alternative measure of the quality of director's networks

Our paper uses accounting fraud data to measure the quality of director networks. For robustness, we also use an alternative source of fraud data, the Private International Cartels Data Set (Connor, 2010).[18] This dataset includes more than 2,115 companies involving in price-fixing cartels between 1998 and 2012. As shown in the Internet Appendix A.V., *Advising Quality* remains significant. Consistent with the argument that the fraudulent culture can be transmissible, we find that banks with more connections to cartelists are more likely to commit wrongdoing and are less likely to get detected.

6.6 Using a standard probit model

Our paper uses the bivariate probit model to show that effective boards reduce the probability of the CEO committing misconduct conditional upon detection of misconduct. For robustness, we also show the results of a simple standard probit model to examine the relationship between effective boards and the likelihood of a bank receiving an enforcement action in the Internet Appendix A.VI. *Monitoring Quality* and *Advising Quality* enter negatively and are statistically significant indicating that monitoring and advising are associated with fewer enforcement actions.

[18] We thank John Connor for generously sharing the cartel data with us.

6.7 Alternative bivariate probit model specification

In our baseline model, we have some excluded instruments in both the commission and detection equations. Some studies that use the bivariate model to study fraud have excluded instruments in one equation, say, fraud detection equation, but not the other (e.g. Khanna et al., 2015). To test if our bivariate model is sensitive to the model specification, we remove *ROA*, *Leverage* and *Industry charter value* from the fraud commission equation. The results are in the Internet Appendix A.VII.

6.8 Are our results driven by the post-2007 period?

Table I shows a surge in the number of enforcement actions issued after the 2007 financial crisis. This raises concerns that our results could be driven by the 2008 financial crisis. To address this concern, we split the sample into two groups: before and after the crisis. As shown in the Internet Appendix A.VIII., our results are not driven by the crisis.

6.9 Independent directors

Our definitions of *Monitoring Quality* and *Advising Quality* do not differentiate between directors who are independent and executives who sit on the board. One may argue that our results could be mostly driven by executives on the board who should feel most beholden to the CEO. To address this concern, we limit our analysis to independent directors and calculate the fraction of independent directors who are appointed before the CEO's tenure (*Monitoring Quality of Independent Directors*) and the connections of independent directors (*Advising Quality of Independent Directors*).

As shown in the Internet Appendix A.IX., we find that all results obtained using independent directors are similar to those using all board members. This implies that independent directors can also be susceptible to monitoring quality and advising quality. Monitoring and advising quality among independent directors affects the likelihood of misconduct being committed and detected in the same way as for the complete board. An implication of this finding is that the share of independent directors that has been extensively studied in the literature as a key monitoring device does not sufficiently capture a board's monitoring ability.

7. Conclusions

Trust in the banking sector is vital to the functioning of the financial system and for economic activity. Misconduct in banking undermines the general public's confidence in the safety and soundness of the banking sector. Thus, studying the determinants of bank misconduct is an important topic of potentially wide implications.

In this study, we focus on two key functions of bank boards, monitoring and advising, and find that both functions are effective in reducing the probability that banks receive enforcement actions from regulators. Further analyses reveal that while board monitoring reduces all categories of misconduct, board advising reduces misconduct of a more technical nature. The results are economically meaningful and robust to two-stage instrumental variable analysis. Overall, we identify three channels through which effective boards deter misconduct: effective boards increase the likelihood that misconduct is detected, they reduce bank risk and they increase the penalties imposed on the CEO following the discovery of misconduct. Furthermore, effective boards also mitigate the severity of misconduct.

Our study has important implications for policy makers. The Office of the Comptroller of the Currency (2014) in its recent regulatory guidelines establishes 'heightened expectations' of the role of bank boards in shaping a bank's risk culture and in reducing misconduct cases. These views are echoed by the Financial Stability Board (2014) which places bank boards at the core of effective risk management and emphasizes their responsibility in monitoring and providing "sage advice" to senior management. The findings we report in this paper confirm that boards play an important role in the risk management of banks and that the 'heightened expectations' of boards in preventing misconduct are justified.

Finally, our paper offers novel insights on how to structure bank boards to prevent misconduct. First, our study shows that in addition to monitoring, directors also give advice to the CEO and this plays an important role in preventing misconduct. Thus, the advisory function of boards deserves more attention as part of the governance process. Second, we show that conventional board measures such as board independence and financial expertise have no measurable effect on bank misconduct being committed or detected. By contrast, the board metrics we study in this paper related to monitoring and advising are important predictors of misconduct. Overall, our study illustrates that board governance matters in banking. Our findings demonstrate that governance metrics revolving around CEO connections warrant more attention from regulators, investors and governance activists.

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Table I. Time distribution of banks receiving enforcement actions

This table reports the number of regulatory enforcement actions in our sample over the period of 2000-2013. We also display the number of enforcement actions in our sample in terms of all enforcement actions issued against listed US banks and the total assets of banks receiving enforcement actions in our sample as a percentage of the total assets of all listed US banks that receive enforcement actions each year.

Year	# Enforcement actions in our sample	% All enforcement actions against listed banks	% Total assets of listed banks with enforcement actions
2000	5	55.56%	98.48%
2001	5	41.67%	84.34%
2002	3	37.50%	65.24%
2003	7	70.00%	96.61%
2004	12	80.00%	99.01%
2005	5	50.00%	92.77%
2006	6	66.67%	99.24%
2007	2	50.00%	99.67%
2008	10	62.50%	98.62%
2009	48	82.76%	93.49%
2010	59	88.06%	95.18%
2011	39	90.70%	99.60%
2012	28	90.32%	99.85%
2013	15	83.33%	99.82%
TOTAL	**244**	**78.71%**	**94.42%**

Table II. Descriptive statistics

Definitions of all variables are included in Appendix I. For each variable, the p-value of the difference between banks with misconduct and without misconduct are calculated. ***, **, and * indicate significance at the 1, 5 and 10% level, respectively.

							Misconduct?	
	N	Mean	Median	Std.	p.1	p.99	Yes	No
Key governance measures								
Monitoring Quality	4072	0.544	0.545	0.314	0.000	1.000	0.462	0.548***
Advising Quality	4072	1.815	0.000	3.802	0.000	18.263	1.788	2.338**
Bank-specific characteristics								
ROA (%)	4072	0.580	0.857	1.278	-5.226	2.197	-0.572	0.639***
Leverage	4072	0.906	0.909	0.029	0.815	0.966	0.918	0.905***
Industry charter value	4072	1.503	1.312	0.613	0.787	2.591	1.169	1.169***
Ln(Assets)	4072	21.692	21.328	1.699	19.090	27.298	22.067	21.673***
Asset growth	4072	0.102	0.066	0.190	-0.172	0.789	0.037	0.106***
Portfolio risk	4072	0.728	0.739	0.142	0.314	1.023	0.740	0.727
Charter value	4072	1.503	1.384	0.924	0.139	4.366	1.070	1.526***
Loans	4072	0.666	0.685	0.143	0.135	0.904	0.673	0.666
Non-performing loans	4072	0.002	0.000	0.008	0.000	0.036	0.005	0.002***
Tier-1 capital	4072	0.089	0.086	0.023	0.041	0.161	0.081	0.089
Stock returns	4072	0.010	0.020	0.117	-0.361	0.273	-0.056	0.013***
Corporate governance measures								
Board size	4072	11.598	11.000	3.528	6.000	23.000	11.035	11.626**
Board independence	4072	0.765	0.800	0.138	0.364	0.933	0.772	0.765
Board financial expertise	4072	0.040	0.000	0.077	0.000	0.333	0.050	0.040*
Exposure to misconduct	4072	0.147	0.000	0.569	0.000	3.000	0.172	0.146
Ln (Board age)	4072	4.125	4.126	0.064	3.957	4.288	4.136	4.125**
Institutional ownership	1196	0.243	0.239	0.122	0.017	0.552	0.247	0.242
CEO characteristics and incentives								
Ln (CEO tenure)	4072	1.916	1.988	0.793	0.095	3.395	2.053	1.909**
CEO is chair	4072	0.490	0.000	0.500	0.000	1.000	0.485	0.490
CEO vega/delta	887	0.389	0.286	0.286	0.000	1.623	0.503	0.381**
CEO bonus/total compensation	1273	0.130	0.035	0.166	0.000	0.623	0.122	0.131
CEO ownership	1273	0.028	0.008	0.069	0.000	0.434	0.050	0.027***
CEO dismissal	4072	0.091	0.000	0.288	0.000	1.000	0.111	0.090
Ln(CEO total pay)	1273	7.740	7.585	1.151	5.757	10.593	7.954	7.725*
CEO pay slice	1196	0.376	0.364	0.109	0.124	0.742	0.376	0.376
CEO vega	887	221.473	53.111	412.213	0.000	1908.120	239.649	220.281
Top-5 characteristics								
% Ivy League executives	1196	0.125	0.000	0.185	0.000	0.600	0.135	0.125
% MBA executives	1196	0.294	0.200	0.256	0.000	1.000	0.329	0.292
% Military executives	1196	0.058	0.000	0.120	0.000	0.600	0.044	0.059
Detection of misconduct								
Abnormal ROA	3018	0.000	0.217	1.164	-4.864	2.302	-0.960	0.055***
Adverse stock return	3018	0.045	0.000	0.207	0.000	1.000	0.197	0.037***
Abnormal stock volatility	3018	0.000	-0.009	0.063	-0.124	0.219	0.043	-0.002***
Abnormal stock turnover	3018	0.000	-0.024	0.740	-1.765	2.484	0.282	-0.014***
Instrumental variables								
Ln(Distance airport)	4072	2.539	2.485	0.778	0.531	4.329	2.480	2.418
Ln(Population)	4072	0.771	1.000	0.420	0.000	1.000	0.798	0.769

Table III. Bivariate probit model estimation for board effectiveness and bank misconduct

Columns (1) and (3) report the estimated relations between *Monitoring Quality* and *Advising Quality* and the commission of misconduct (M=1), and Columns (2) and (4) report the relations between *Monitoring Quality* and *Advising Quality* and detection, given misconduct (D=1|M=1). Standard errors are clustered at the bank level. The sample covers the period 1999–2012. Definitions of all variables are provided in Appendix I. *t-Statistics* are reported in parentheses. ***, **, and * indicate significance at the 1, 5 and 10% level, respectively.

	P(M=1)	**P(D=1|M=1)**	**P(M=1)**	**P(D=1|M=1)**
	(1)	**(2)**	**(3)**	**(4)**
Monitoring Quality	-1.180***	2.187**		
	(-3.212)	(2.044)		
Advising Quality			-0.131***	0.087***
			(-3.839)	(3.360)
ROA	-0.003		0.203**	
	(-0.058)		(2.264)	
Leverage	9.440***		10.789**	
	(2.925)		(2.386)	
Industry Charter Value	-4.923***		-10.326***	
	(-3.111)		(-4.205)	
(Industry Charter Value)^2	1.594***		3.191***	
	(3.014)		(3.650)	
Ln(Assets)	-0.108	0.873***	0.234***	0.097*
	(-1.254)	(3.890)	(3.066)	(1.815)
Asset growth	-0.224	-2.528*	-0.020	-1.555***
	(-0.347)	(-1.793)	(-0.038)	(-3.917)
Portfolio risk	1.259*	-0.321	0.803	0.819
	(1.955)	(-0.208)	(0.907)	(1.169)
Charter value	-0.305***	0.372	-0.354***	0.044
	(-2.968)	(1.535)	(-3.679)	(0.532)
Loans	-1.872**	5.728**	1.016	-0.270
	(-2.255)	(2.490)	(1.364)	(-0.408)
Non-performing loans	10.526	-26.039*	18.607	-12.635**
	(0.976)	(-1.766)	(1.550)	(-2.479)
Tier-1 capital	-2.253	11.234	-6.645	-0.574
	(-0.541)	(1.075)	(-1.338)	(-0.189)
Board size	0.038	-0.204***	-0.018	-0.031
	(1.437)	(-2.594)	(-0.310)	(-1.452)
Board independence	0.241	-0.297	-1.107	0.360
	(0.372)	(-0.185)	(-0.643)	(0.594)
Board financial expertise	0.900	-2.084	0.606	-0.025
	(1.315)	(-1.232)	(0.685)	(-0.043)
Exposure to misconduct	0.391**	-1.209***	0.318*	-0.347***
	(2.115)	(-3.453)	(1.851)	(-3.200)
Ln (Board age)	3.243***	-2.876	-0.215	2.255**
	(2.951)	(-0.849)	(-0.140)	(2.504)
Ln (CEO tenure)	-0.133	0.335	0.414***	0.048
	(-1.023)	(1.048)	(4.067)	(0.619)
CEO is chair	0.510***	-1.610**	0.910***	-0.314***
	(2.942)	(-2.546)	(3.729)	(-2.709)
Abnormal ROA		-0.574***		-0.359***
		(-2.925)		(-5.499)
Adverse stock return		0.584		0.559***
		(1.189)		(3.062)
Abnormal stock volatility		3.544*		3.761***
		(1.725)		(3.644)
Abnormal stock turnover		-0.128		-0.091
		(-0.790)		(-1.474)
Observations	3004	3004	3004	3004
Prob>Chi^2	0.000	0.000	0.000	0.000
Log likelihood	-497	-497	-491	-491

Table IV. Board effectiveness and bank misconduct: CEO characteristics

Columns (1) and (3) report the estimated relations between CEO characteristics and the commission of misconduct (M=1), and Columns (2) and (4) report the relations between CEO characteristics and detection, given misconduct (D=1|M=1). *Monitoring Quality* and *Advising Quality* and detection, given misconduct (D=1|M=1). Standard errors are clustered at the bank level. The sample covers the period 1999–2012. Definitions of all variables are provided in Appendix I. *t-Statistics* are reported in parentheses. ***, **, and * indicate significance at the 1, 5 and 10% level, respectively.

	P(M=1)	**P(D=1|M=1)**	**P(M=1)**	**P(D=1|M=1)**
	(1)	**(2)**	**(3)**	**(4)**
Monitoring Quality	-3.453***	2.120**	-1.480***	2.331**
	(-4.050)	(2.236)	(-3.035)	(2.291)
Advising Quality	-0.348***	0.350***	-0.128***	0.762***
	(-3.315)	(3.948)	(-3.921)	(4.574)
CEO vega/delta	1.426***	0.412		
	(4.039)	(1.587)		
CEO bonus/total compensation	2.162**	1.343		
	(2.051)	(1.470)		
CEO ownership	-1.656	4.805***		
	(-0.774)	(2.956)		
% Ivy League executives			-1.570***	10.033***
			(-2.781)	(5.350)
% MBA executives			0.257	1.245*
			(0.728)	(1.645)
% Military executives			0.182	-2.122
			(0.212)	(-1.602)
Other controls	Yes	Yes	Yes	Yes
Observations	722	722	945	945
Log likelihood	-117	-117	-176	-176
Prob > Chi^2	0.000	0.000	0.000	0.000

Table V. Board effectiveness and bank misconduct: Split-sample tests

Panel A displays the summary statistics of the two enforcement actions types. In both Panels B and C, odd-numbered columns report the estimated relations between *Monitoring Quality* and *Advising Quality* and the commission of misconduct (M=1), and even-numbered columns report the relations between *Monitoring Quality* and *Advising Quality* and detection, given misconduct (D=1|M=1). Panel B splits the enforcement actions sample into technical enforcement actions and non-technical enforcement actions. Panel C uses alternative proxies of board advising and re-estimate the relations between Advising Quality and the likelihood of **Technical** enforcement actions. Columns (1) and (2) report our estimation using the baseline definition of *Advising Quality*, measured as the number of directors to whom directors on the board are collectively connected, scaled by board size. Columns (3) and (4) report our estimation using *Industry Connections*, which imposes the additional restriction that connected directors should sit on the board of financial services firms. Columns (5) and (6) report our estimation using *Large Firm Connections*, which includes the requirement that a connected director should sit on the board of large firms. Standard errors are clustered at the bank level. The sample covers the period 1999–2012. Definitions of all variables are provided in Appendix I. *t-Statistics* are reported in parentheses. ***, **, and * indicate significance at the 1, 5 and 10% level, respectively.

Panel A: Summary statistics on regulatory enforcement actions split by degree of technicality

	N
i. Technical Enforcement Actions Enforcement actions taken for violations of capital adequacy and liquidity, asset quality, lending, provisions and reserves.	**147**
ii. Non-technical enforcement Actions Enforcement actions related to failures of the bank's internal control and audit systems, risk management systems, and anti-money laundering systems. This also includes breaches of the requirements concerning the competency of the senior management team and the board of directors as well as violations of various laws such as consumer compliance programs, Federal Trade Commission Act (FTCA), and the Equal Credit Opportunity Act (ECOA).	**97**

Panel B: By types of regulatory enforcement actions

	P(M=1)	P(D=1|M=1)	P(M=1)	P(D=1|M=1)	P(M=1)	P(D=1|M=1)	P(M=1)	P(D=1|M=1)
	Technical				Non-technical			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Monitoring Quality	-1.165***	4.308**			-0.782**	1.255**		
	(-3.174)	(2.510)			(-2.341)	(2.501)		
Advising Quality			-0.074**	0.338***			-0.037	0.477
			(-2.156)	(3.011)			(-1.601)	(1.146)
Other controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3004	3004	3004	3004	3004	3004	3004	3004
Log likelihood	-251	-251	-251	-251	-256	-256	-208	-208
Prob > Chi^2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Panel C: Alternative proxies of Advising Quality and Technical Enforcement Actions

	P(M=1)	P(D=1|M=1)	P(M=1)	P(D=1|M=1)	P(M=1)	P(D=1|M=1)
	All connections		Industry connections		Large firm connections	
	(1)	(2)	(3)	(4)	(5)	(6)
Advising Quality	-0.074**	0.338***	-0.191***	0.411***	-0.135***	0.377**
	(-2.156)	(3.011)	(2.821)	(3.073)	(-2.671)	(2.332)
Other controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3004	3004	3004	3004	3004	3004
Log likelihood	-251	-251	-300	-300	-261	-261
Prob > Chi^2	0.000	0.000	0.000	0.000	0.000	0.000

Table VI. Instrumental variable regressions for board effectiveness and bank wrongdoing

This table reports the instrumental variable (IV) regression results. The endogenous variables are *Monitoring Quality* and *Advising Quality*. The instrumental variables are *Ln(Distance Airport),* the natural logarithm of the distance from the bank's headquarters to the nearest airport and *Ln(Population)*, the natural logarithm of the population of the county of the bank's headquarters. Columns (1), (2), (5) and (6) report the first-stage estimation results while Columns (3), (4), (7) and (8) report the second-stage results. The sample covers the period 1999–2012. Definitions of all variables are provided in Appendix I. *t-Statistics* are reported in parentheses. ***, **, and * indicate significance at the 1, 5 and 10% level, respectively.

	1st stage		**2nd stage**		**1st stage**		**2nd stage**	
	Monitoring Quality		**P(M=1)**	**P(D=1|M=1)**	**Advising Quality**		**P(M=1)**	**P(D=1|M=1)**
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
Ln(Distance airport)	-0.016***	-0.020***			0.005	0.020		
	(-4.353)	(-4.724)			(0.157)	(0.544)		
Ln(Population)	-0.011***	-0.011***			0.144***	0.163***		
	(-4.262)	(-4.984)			(5.926)	(5.354)		
Fitted Monitoring Quality			**-17.619***	**48.254***				
			(-4.805)	**(6.282)**				
Fitted Advising Quality							**-0.596***	**0.492***
							(-5.057)	**(2.781)**
Other controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	4072	3004	3004	3004	4072	3004	3004	3004
R-Squared	0.648	0.652			0.673	0.682		
Log likelihood			-463	-463			-350	-350
Prob>Chi^2			0.000	0.000			0.000	0.000
F-statistics (IVs)	10.147	10.764			11.018	11.453		

Table VII. Board quality and bank's accounting measures of risk

This table estimates the impact of board monitoring and advising quality on various measures of risk. The dependent variables are Tier-1 capital ratio, bank's portfolio risk and the fraction of non-performing loans. All models include year dummies and bank-fixed effects. Standard errors are clustered at the bank level. The sample covers the period 1999–2012. Definitions of all variables are provided in Appendix I. *t-Statistics* are reported in parentheses. ***, **, and * indicate significance at the 1, 5 and 10% level, respectively.

	Tier-1 capital		**Portfolio risk**		**Non-performing loans**	
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Monitoring Quality	0.006**		-0.029***		-0.004***	
	(2.263)		(-3.082)		(-4.025)	
Advising Quality		0.0004**		0.0002		-0.000
		(2.019)		(0.146)		(-0.401)
ROA	0.000	0.000	0.009***	0.009***	-0.001***	-0.001**
	(0.818)	(0.883)	(5.906)	(5.922)	(-3.748)	(-2.091)
Leverage	-0.340***	-0.341***	0.725***	0.720***	0.021**	0.021*
	(-11.920)	(-11.840)	(2.860)	(2.832)	(2.051)	(1.877)
Ln(Assets)	-0.002	-0.003*	-0.004	-0.003	-0.001	-0.001
	(-1.480)	(-1.671)	(-0.398)	(-0.360)	(-1.122)	(-0.809)
Asset growth	-0.006***	-0.006***	-0.002	-0.002	0.000	0.000
	(-3.086)	(-3.202)	(-0.267)	(-0.246)	(0.523)	(0.574)
Portfolio risk	0.026**	0.026**	-	-	0.004	0.005
	(2.374)	(2.321)	-	-	(1.636)	(0.741)
Charter value	0.001*	0.001*	-0.005	-0.005	0.000*	0.000
	(1.713)	(1.710)	(-1.251)	(-1.240)	(1.745)	(1.264)
Loans	0.007	0.007	0.520***	0.522***	-0.007**	-0.007
	(0.739)	(0.803)	(9.800)	(9.855)	(-2.456)	(-1.071)
Non-performing loans	0.084*	0.081*	0.577**	0.599*	-	-
	(1.959)	(1.838)	(1.961)	(1.956)	-	-
Tier-1 capital	-	-	0.659*	0.642*	-0.001	-0.003
	-	-	(1.950)	(1.895)	(-0.104)	(-0.211)
Board size	-0.000	-0.000	0.000	0.001	-0.000***	-0.000***
	(-0.658)	(-1.262)	(0.307)	(0.993)	(-3.205)	(-2.956)
Board independence	0.008*	0.006	-0.008	-0.002	-0.005**	-0.004
	(1.755)	(1.419)	(-0.414)	(-0.132)	(-2.556)	(-1.564)
Board financial expertise	0.014**	0.013**	0.029	0.032	0.004	0.004
	(2.075)	(1.983)	(0.733)	(0.799)	(1.228)	(0.556)
Exposure to misconduct	0.000	-0.000	0.001	0.001	0.000	0.001
	(0.280)	(-0.571)	(0.138)	(0.075)	(1.260)	(1.329)
Ln (Board age)	0.007	0.015	-0.037	-0.073*	-0.001	-0.006
	(0.590)	(1.531)	(-0.889)	(-1.808)	(-0.155)	(-0.908)
Ln (CEO tenure)	0.000	-0.002***	-0.006*	0.003	-0.001***	-0.000
	(0.122)	(-2.847)	(-1.732)	(1.357)	(-3.244)	(-0.072)
CEO is chair	-0.000	-0.000	-0.000	-0.000	-0.002***	-0.002**
	(-0.257)	(-0.230)	(-0.018)	(-0.013)	(-4.058)	(-2.350)
Bank-fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3519	3519	3519	3519	3519	3519
R-Squared	0.672	0.671	0.821	0.820	0.524	0.522

Table VIII. Board quality and CEO's anticipated costs of misconduct

This table estimates the impact of board monitoring and advising quality on a CEO's penalties following an enforcement action. The dependent variables are an indicator of CEO dismissal, Ln(CEO total pay), the level of CEO pay relative to other top executives at the same bank (CEO pay slice) and CEO pay-risk sensitivity (vega). All models include year dummies and bank-fixed effects. Standard errors are clustered at the bank level. The sample covers the period 1999–2012. Definitions of all variables are provided in Appendix I. *t-Statistics* are reported in parentheses. ***, **, and * indicate significance at the 1, 5 and 10% level, respectively.

Panel A: Monitoring quality and CEO's anticipated costs of misconduct

	CEO dismissal		**CEO pay**		**CEO pay slice**		**CEO vega**	
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
Monitoring Quality		**0.095**		**-0.478****		**-0.117****		**-0.113***
*** Misconduct**		**(0.611)**		**(-2.335)**		**(-2.437)**		**(-1.798)**
Misconduct	0.014	-0.035	0.061	0.308**	0.017	0.015	-0.013	0.048
	(0.275)	(-0.401)	(0.634)	(1.998)	(0.699)	(0.479)	(-0.267)	(0.725)
Monitoring Quality	-0.067	-0.075	-0.004	0.037	0.005	0.078*	0.036	0.046
	(-0.877)	(-0.995)	(-0.021)	(0.200)	(0.171)	(1.797)	(0.562)	(0.817)
ROA	-0.025	-0.025	0.029	0.028	0.000	0.000	0.001	0.002
	(-1.528)	(-1.526)	(0.934)	(0.930)	(0.123)	(0.129)	(0.172)	(0.255)
Leverage	0.832	0.818	0.304**	0.311**	-0.072	-0.055	-0.466	-0.460
	(1.489)	(1.466)	(2.417)	(2.456)	(-0.427)	(-0.327)	(-1.045)	(-1.024)
Ln(Assets)	-0.054	-0.055	-	-	0.002	0.004	0.029	0.031
	(-0.995)	(-1.021)	-	-	(0.103)	(0.182)	(0.504)	(0.544)
Charter value	-0.058**	-0.059**	0.123***	0.129***	0.007	0.009	0.050	0.052
	(-2.116)	(-2.112)	(2.857)	(3.006)	(0.939)	(1.101)	(1.397)	(1.436)
Board size	0.009	0.009	0.002	0.003	-0.001	-0.001	-0.001	-0.001
	(1.543)	(1.532)	(0.179)	(0.200)	(-0.620)	(-0.579)	(-0.206)	(-0.149)
Board independence	-0.319*	-0.319*	-0.706**	-0.708**	0.003	0.003	0.100	0.098
	(-1.959)	(-1.967)	(-2.250)	(-2.247)	(0.061)	(0.059)	(0.502)	(0.493)
Board financial expertise	0.062	0.061	0.272	0.278	0.054	0.056	-0.261	-0.259
	(0.266)	(0.260)	(0.594)	(0.600)	(0.606)	(0.621)	(-1.302)	(-1.293)
Exposure to misconduct	-0.368	-0.360	-1.095	-1.132	-0.235	-0.245	-0.140	-0.143
	(-0.737)	(-0.722)	(-1.118)	(-1.135)	(-1.280)	(-1.304)	(-0.575)	(-0.583)
Ln (Board age)	0.005	0.005	0.034	0.032	0.010	0.010	0.050*	0.050*
	(0.202)	(0.221)	(0.909)	(0.854)	(1.652)	(1.593)	(1.721)	(1.705)
Ln (CEO tenure)	0.024***	0.024***	-0.004	-0.004	-0.001	-0.001	0.005*	0.005*
	(4.387)	(4.359)	(-0.325)	(-0.369)	(-0.240)	(-0.295)	(1.667)	(1.699)
CEO is chair	0.022	0.024	0.087	0.080	-0.005	-0.006	-	-
	(0.447)	(0.470)	(1.005)	(0.933)	(-0.334)	(-0.446)	-	-
CEO ownership	-0.642***	-0.649***	-0.332	-0.292	-0.200	-0.191	-0.028	-0.029
	(-2.630)	(-2.645)	(-0.481)	(-0.429)	(-1.469)	(-1.425)	(-0.638)	(-0.674)
Stock returns	-0.025	-0.029	0.154	0.596	0.002	0.007	-0.030	-0.026
	(-0.145)	(-0.167)	(0.658)	(0.780)	(0.050)	(0.178)	(-0.276)	(-0.238)
Institutional ownership	-0.195	-0.188	0.816*	0.777	0.093	0.084	0.079	0.074
	(-0.960)	(-0.929)	(1.709)	(1.623)	(1.142)	(1.044)	(0.441)	(0.413)
Bank-fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	944	944	944	944	944	944	738	738
R-Squared	0.247	0.248	0.855	0.856	0.465	0.472	0.786	0.787

Panel B: Advising Quality and CEO's anticipated costs of misconduct

	CEO dismissal	**CEO pay**	**CEO pay slice**	**CEO vega**
	(1)	(2)	(3)	(4)
Advising Quality	-0.012	0.001	0.003	0.014
*Misconduct	(-1.607)	(0.038)	(0.455)	(1.084)
Misconduct	0.056	0.051	0.006	-0.045
	(0.841)	(0.404)	(0.211)	(-0.932)
Advising Quality	0.005	-0.009	0.001	0.013
	(0.854)	(-0.569)	(0.219)	(1.231)

Table IX. Do effective boards alleviate shareholder wealth losses when misconduct becomes public?

This table reports the multivariate regression analyses of stock market reactions to the announcements of banks receiving an enforcement action. The dependent variables of all models are CARs for a three-day window [-1, +1] (%). All models include year dummies. Definitions of all variables are provided in Appendix I. *t-Statistics* are reported in parentheses. ***, **, and * indicate significance at the 1, 5 and 10% level, respectively.

	CARs [-1, +1] %			
	(1)	**(2)**	**(3)**	**(4)**
Monitoring Quality$_{t-1}$	6.237**			
	(2.127)			
Monitoring Quality $_t$		5.927**		
		(2.507)		
Advising Quality$_{t-1}$			-0.134	
			(-0.786)	
Advising Quality $_t$				-0.145
				(-0.752)
ROA	0.626*	0.491	0.595	0.621*
	(1.713)	(1.365)	(1.639)	(1.701)
Leverage	-10.245	-15.323	-10.124	-13.629
	(-0.330)	(-0.502)	(-0.328)	(-0.435)
Ln(Assets)	-0.109	0.061	-0.097	0.130
	(-0.260)	(0.146)	(-0.233)	(0.251)
Asset growth	-3.055	-2.795	-3.341	-2.746
	(-0.530)	(-0.493)	(-0.577)	(-0.477)
Portfolio risk	0.734	1.313	0.678	0.819
	(0.083)	(0.151)	(0.077)	(0.093)
Charter value	0.363	0.492	0.280	0.340
	(0.563)	(0.775)	(0.434)	(0.530)
Loans	-4.683	-3.531	-3.890	-4.137
	(-0.587)	(-0.450)	(-0.488)	(-0.520)
Non-performing loans	6.167	14.100	4.250	8.097
	(0.175)	(0.406)	(0.121)	(0.229)
Tier-1 capital	-0.997	-6.661	-2.642	-4.411
	(-0.030)	(-0.204)	(-0.079)	(-0.131)
Board size	0.458**	0.379*	0.449**	0.447**
	(2.113)	(1.759)	(2.051)	(2.037)
Board independence	5.802	3.956	5.092	5.574
	(1.112)	(0.766)	(0.975)	(1.067)
Board financial expertise	2.837	3.257	2.416	2.414
	(0.455)	(0.531)	(0.388)	(0.387)
Exposure to misconduct	-0.670	-0.398	-0.033	-0.734
	(-0.655)	(-0.395)	(-0.025)	(-0.719)
Ln (Board age)	10.751	10.903	12.208	12.077
	(1.123)	(1.159)	(1.268)	(1.256)
Ln (CEO tenure)	-0.419	0.993	-0.079	-0.078
	(-0.651)	(1.175)	(-1.045)	(-1.031)
CEO is chair	0.785	0.302	1.025	1.001
	(0.560)	(0.217)	(0.722)	(0.705)
Constant	-41.393	-46.007	-47.340	-48.467
	(-0.780)	(-0.884)	(-0.896)	(-0.915)
Observations	206	206	206	206
R-squared	0.216	0.225	0.197	0.193

Appendix I. Definition of variables

Variable	Definition	Source
Key governance measures		
Monitoring Quality	The fraction of board members who are appointed before the CEO takes office	BoardEx
Advising Quality	The number of directors to whom board members on the board are collectively connected, scaled by board size	BoardEx
Residual Monitoring Quality	The residual from a regression of *Monitoring Quality* on Ln(CEO tenure)	BoardEx
Board-tenure adjusted monitoring quality	The residual from a regression of *Monitoring Quality* on Ln(Board tenure)	BoardEx
Monitoring Quality of independent directors	The fraction of independent directors who are appointed before the current CEO.	BoardEx
Advising Quality of independent directors	The number of directors to whom independent directors on the board are collectively connected, scaled by the total number of independent directors sitting on the board.	BoardEx
Bank-specific characteristics		
ROA (%)	Earnings before interest and taxes (EBIT) divided by book value of total assets (BHCK2170)	CRSP, FR Y9-C
Leverage	Book value of liabilities divided by book value of total assets	FR Y-9C
Industry charter value	The median charter value in a given year	FR Y-9C
Ln(Assets)	Natural logarithm of total assets (BHCK2170)	FR Y-9C
Asset growth	The percentage of change in total assets relative to prior year	FR Y-9C
Portfolio risk	Ratio of risk-weighted assets (BHCKA223) divided by total assets	FR Y-9C
Charter value	Market value of equity divided by book value of equity	CRSP, FR Y9-C
Loans	Ratio of total loans (BHCK2122) divided by total assets	FR Y-9C
Non-performing loans	Ratio of loans past due day 90 days or more (BHCK5525) and nonaccrual loans (BHCK5526) divided by total assets	FR Y-9C
Tier-1 capital	Ratio of Tier-1 capital (BHCK8274) divided by total assets	FR Y-9C
Stock returns	Annual buy-and-hold stock returns	CRSP
Corporate governance measures		
Board size	The number of directors sitting on the board	BoardEx
Board independence	The fraction of non-executive directors on the board	BoardEx
Board financial expertise	The fraction of independent directors with prior experience working as a CFO or finance director	BoardEx
Exposure to misconduct	The aggregate connections board members have with firms that involved in a misconduct case committed within the past 10 years	AAERs
Exposure to cartel networks	The aggregate connections board members have with firms that involved in a price-fixing cartel discovered within the past 10 years	Private International Cartels
Ln (Board age)	Natural logarithm of the average age of board members	BoardEx
Ln (Board tenure)	Natural logarithm of the average tenure of board members	BoardEx
Age <65	The fraction of board members whose age is below 65	BoardEx
First and only directorship	The fraction of board members whose current appointment at the bank is their first and only directorship.	BoardEx
Board busyness	Dummy equals 1 if the majority of board members hold three or more directorships and 0 otherwise.	BoardEx
Institutional ownership	The fraction of shares held by investment companies and independent investment advisors	Thomson One Banker
CEO characteristics and incentives		
Ln (CEO tenure)	Natural logarithm of the number of years the CEO has served in this position	BoardEx
CEO is chair	Dummy that equals 1 if CEO is also the chairperson	BoardEx
CEO bonus/total compensation	CEO bonus divided by CEO total pay	ExecuComp
CEO ownership	The fraction of shares owned by the CEO	ExecuComp

CEO dismissal	We follow Khanna, Kim, and Lu (2015) to identify CEO dismissal. If the press reports the CEO turnover as "fired", "forced out", "dismissed", "resigned following a period of bad performance" or "resigned due to policy differences" it is classified as forced. We classify all departures of CEOs who are older than 60 as voluntary. We classify departures of CEOs who are younger than 60 as "dismissed" if the press does not report the reason as "poor health", "death", or "acceptance of another position"; or if the article reports the CEO is retiring, but does not announce the succession plan at least six months before the new CEO takes office.	Factiva
Ln(CEO total pay)	The natural logarithm of CEO total pay	ExecuComp
CEO pay slice	The fraction of top five executives' pay captured by the CEO	ExecuComp
CEO vega	Sensitivity of CEO compensation to share price, expressed in $'1000	ExecuComp
CEO delta	Sensitivity of CEO compensation to stock return volatility, expressed in $'1000	ExecuComp
Characteristics of top five executives		
% Ivy League executives	The fraction of top five executives with an Ivy League education	BoardEx
% MBA executives	The fraction of top five executives with an MBA degree	BoardEx
% Military executives	The fraction of top five executives with prior military experience	BoardEx
Detection of misconduct		
Abnormal ROA	Residual from the regression: $ROA_t = \alpha_0 + \alpha_1 ROA_{t-1} + \alpha_2 ROA_{t-2} + \varepsilon$	CRSP
Adverse stock return	Dummy equals 1 if stock return is below -20% (or in the bottom 10% of all stocks in CRSP bank sample)	CRSP
Abnormal stock volatility	The demeaned standard deviation of daily stock volatility in a year	CRSP
Abnormal stock turnover	The demeaned average daily stock turnover in a year	CRSP
Instrumental variables		
Ln(Distance airport)	Natural logarithm of the distance from the bank's headquarters to the nearest airport	US Census file
Ln(Population)	Natural logarithm of the population of the county of the bank's headquarters	US Census Bureau
Types of Enforcement Actions		
Technical misconduct	Enforcement actions taken for violations of capital adequacy and liquidity, asset quality, lending, provisions and reserves.	SNL Financial, Factiva
Non-technical misconduct	Enforcement actions related to failures of the bank's internal control and audit systems, risk management systems, and anti-money laundering systems. This also includes breaches of the requirements concerning the competency of the senior management team and the board of directors as well as violations of various laws such as consumer compliance programs, Federal Trade Commission Act (FTCA), Equal Credit Opportunities Act (ECOA) etc.	SNL Financial, Factiva

Internet Appendix

Can Bank Boards Prevent Misconduct?

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This appendix contains information and tabulated results of additional tests on the relationship between effective board monitoring and advising and bank misconduct.

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Table A.I. Is Monitoring Quality driven by CEO tenure?

Residual Monitoring Quality is the residual from a regression of *Monitoring Quality* on *Ln(CEO tenure)*. Column (1) reports the estimated relations between *Residual Monitoring Quality* and the commission of misconduct (M=1), and Column (2) reports the relations between *Residual Monitoring Quality* and detection, given misconduct (D=1|M=1). Standard errors are clustered at the bank level. The sample covers the period 1999–2012. Definitions of all variables are provided in Appendix I. *t-Statistics* are reported in parentheses. ***, **, and * indicate significance at the 1, 5 and 10% level, respectively.

	P(M=1)	**P(D=1|M=1)**
	(1)	**(2)**
Residual Monitoring Quality	-1.162***	2.154**
	(-3.194)	(2.016)
Other controls	Yes	Yes
Observations	3004	3004
Log likelihood	-497	-497
Prob>Chi^2	0.000	0.000

Table A.II. Does Monitoring Quality capture director experience?

Ln(Board tenure) is the natural logarithm of the average tenure of board members. Panel A reports the results when *Monitoring Quality* and *Ln(Board tenure)* are both included in the model. Panel B reports the residual regression results. *Board-tenure adjusted monitoring quality* is the residual from a regression of *Monitoring Quality* on *Ln(Board tenure)*. Standard errors are clustered at the bank level. The sample covers the period 1999–2012. Definitions of all variables are provided in Appendix 1. *t-Statistics* are reported in parentheses. ***, **, and * indicate significance at the 1, 5 and 10% level, respectively.

Panel A: Controlling for average board tenure		
	P(M=1)	**P(D=1|M=1)**
	(1)	**(2)**
Monitoring Quality	-1.244***	2.478**
	(-3.292)	(2.129)
Ln (Board tenure)	0.017	-0.035
	(0.784)	(-0.530)
Other controls	Yes	Yes
Observations	3004	3004
Log likelihood	-497	-497
Prob>Chi^2	0.000	0.000
Panel B: Residual regression		
	P(M=1)	**P(D=1|M=1)**
	(1)	**(2)**
Board-tenure adjusted monitoring quality	-2.143***	0.440*
	(-6.267)	(1.845)
Other controls	Yes	Yes
Observations	3004	3004
Log likelihood	-497	-497
Prob>Chi^2	0.000	0.000

Table A.III. Is Monitoring Quality capturing director's career concerns?

This table controls for alternative measures of director's career concerns. *Age<65* is the fraction of board members whose age is below 65. *First and only directorship* is the fraction of board members whose current appointment at the bank is their first and only directorship. Panel A reports the results when *Monitoring Quality* and *Age<65* are both included in the model. Panel B reports the results when *Monitoring Quality* and *First and only directorship* are both included in the model. Standard errors are clustered at the bank level. The sample covers the period 1999–2012. Definitions of all variables are provided in Appendix 1. *t-Statistics* are reported in parentheses. ***, **, and * indicate significance at the 1, 5 and 10% level, respectively.

Panel A: % of board members <65		
	P(M=1)	**P(D=1|M=1)**
	(1)	**(2)**
Monitoring Quality	-1.170***	2.242**
	(-3.183)	(2.092)
Age <65	-0.108	0.975
	(-0.175)	(0.564)
Other controls	Yes	Yes
Observations	3004	3004
Log likelihood	-497	-497
Prob>Chi^2	0.000	0.000
Panel B: % first and only directorship		
	P(M=1)	**P(D=1|M=1)**
	(1)	**(2)**
Monitoring Quality	-0.961***	1.708*
	(-2.901)	(1.714)
First and only directorship	0.277	-0.599
	(0.703)	(-0.570)
Other controls	Yes	Yes
Observations	3004	3004
Log likelihood	-497	-497
Prob>Chi^2	0.000	0.000

Table A.IV. Does Advising Quality capture Board busyness?

Board busyness is a dummy that equals 1 when the majority of board members hold three or more directorships and 0 otherwise. Panel A reports the results when *Advising Quality* and *Board busyness* are both included in the analysis. Panel B reports the results when only *Board busyness* is included. Standard errors are clustered at the bank level. The sample covers the period 1999–2012. Definitions of all variables are provided in Appendix 1. *t-Statistics* are reported in parentheses. ***, **, and * indicate significance at the 1, 5 and 10% level, respectively.

Panel A: Advising Quality and Board busyness are included		
	P(M=1)	**P(D=1|M=1)**
	(1)	**(2)**
Advising Quality	-0.065**	0.966***
	(-2.496)	(3.391)
Board busyness	0.162	-1.354
	(0.430)	(-0.119)
Other controls	Yes	Yes
Observations	1019	1019
Log likelihood	-177	-177
Prob>Chi^2	0.000	0.000

Panel B: Only Board busyness is included		
	P(M=1)	**P(D=1|M=1)**
	(1)	**(2)**
Board busyness	0.091	-0.542
	(0.137)	(-0.247)
Other controls	Yes	Yes
Observations	945	945
Log likelihood	-195	-195
Prob>Chi^2	0.000	0.000

Table A.V. Alternative measure of director network quality

This table uses an alternative source of fraud data for the quality director's network. We use the Private International Cartels Data Set (Connor, 2010), provided by John Connor, which includes more than 2,115 companies involving in price-fixing cartels. *Exposure to Cartel Networks* is the number of connections that board members of a given bank have with firms that used to be involved in a price-fixing cartel. The sample covers the period 1999–2012. Definitions of all variables are provided in Appendix 1. *t-Statistics* are reported in parentheses. ***, **, and * indicate significance at the 1, 5 and 10% level, respectively.

	P(M=1)	**P(D=1|M=1)**
	(1)	**(2)**
Advising Quality	-0.059**	0.123***
	(-2.056)	(3.549)
Exposure to Cartel Networks	0.148*	-0.302**
	(1.693)	(-2.367)
Other controls	Yes	Yes
Observations	3004	3004
Log likelihood	-497	-497
Prob>Chi^2	0.000	0.000

Table A.VI. Probit model estimation for board effectiveness and bank misconduct

This table reports standard probit model estimation results. The dependent variable equals 1 if an enforcement action is issued during the year. Standard errors are clustered at the bank level. The sample covers the period 1999–2012. Definitions of all variables are provided in Appendix 1. *t-Statistics* are reported in parentheses. ***, **, and * indicate significance at the 1, 5 and 10% level, respectively.

	Probit P(M=1)	**Probit P(M=1)**	**Probit P(M=1)**
	(1)	**(2)**	**(3)**
Monitoring Quality	-0.468**		-0.476**
	(-2.409)		(-2.448)
Advising Quality		-0.034*	-0.035*
		(-1.665)	(-1.706)
ROA	-0.136***	-0.139***	-0.139***
	(-4.871)	(-4.975)	(-4.982)
Leverage	4.886**	4.984**	4.766**
	(2.522)	(2.570)	(2.470)
Ln(Assets)	0.242***	0.279***	0.296***
	(3.004)	(3.378)	(3.564)
Asset growth	-0.567*	-0.541*	-0.563*
	(-1.869)	(-1.746)	(-1.844)
Portfolio risk	0.643	0.616	0.818
	(1.230)	(1.139)	(1.558)
Charter value	-0.132	-0.129	-0.132
	(-1.558)	(-1.473)	(-1.549)
Loans	-0.173	-0.200	-0.313
	(-0.354)	(-0.403)	(-0.641)
Non-performing loans	6.917	8.065	6.971
	(1.273)	(1.440)	(1.282)
Tier-1 Capital	-1.058	-0.982	-1.197
	(-0.413)	(-0.375)	(-0.470)
Board size	-0.030**	-0.063	-0.030**
	(-2.082)	(-0.206)	(-2.074)
Board independence	-0.151	0.155	-0.118
	(-0.492)	(0.328)	(-0.378)
Board financial expertise	-0.116	1.421*	-0.096
	(-0.238)	(1.922)	(-0.198)
Exposure to misconduct	-0.131	0.149	-0.082
	(-1.353)	(1.407)	(-0.768)
Ln (Board age)	1.570**	0.018***	1.581**
	(2.166)	(3.298)	(2.182)
Ln (CEO tenure)	0.004	-0.059	0.003
	(0.435)	(-0.704)	(0.297)
CEO is chair	-0.053	0.376***	-0.043
	(-0.622)	(3.802)	(-0.511)
Observations	4066	4066	4066
Prob>Chi^2	0.000	0.000	0.000
Log likelihood	-682	-687	-680

Table A.VII. Alternative specification of bivariate probit model

Columns (1) and (3) report the estimated relations between *Monitoring Quality* and *Advising Quality* and the commission of misconduct (M=1), and Columns (2) and (4) report the relations between *Monitoring Quality* and *Advising Quality* and detection, given misconduct (D=1|M=1). Standard errors are clustered at the bank level. The sample covers the period 1999–2012. Definitions of all variables are provided in Appendix 1. *t-Statistics* are reported in parentheses. ***, **, and * indicate significance at the 1, 5 and 10% level, respectively.

	P(M=1)	**P(D=1|M=1)**	**P(M=1)**	**P(D=1|M=1)**
	(1)	**(2)**	**(3)**	**(4)**
Monitoring Quality	-1.150**	1.373**		
	(-2.208)	(2.085)		
Advising Quality			-0.094***	0.092***
			(-4.003)	(4.159)
Ln(Assets)	-0.207**	0.422***	0.084	0.147***
	(-2.329)	(3.524)	(1.353)	(3.056)
Asset growth	-0.198	-0.772	0.914	-1.738***
	(-0.203)	(-0.640)	(1.394)	(-4.053)
Portfolio risk	0.665	-0.390	0.537	0.955*
	(0.753)	(-0.348)	(0.907)	(1.765)
Charter value	-0.351***	0.342**	-0.381***	-0.040
	(-3.226)	(2.385)	(-5.865)	(-0.569)
Loans	-1.648	2.446*	-0.440	0.066
	(-1.471)	(1.808)	(-0.653)	(0.124)
Non-performing loans	16.012	-24.116	37.403***	-12.232**
	(1.366)	(-1.624)	(4.395)	(-2.109)
Tier-1 capital	-8.192*	8.493	-12.299***	0.398
	(-1.913)	(1.322)	(-4.448)	(0.155)
Board size	0.034	-0.074	-0.032	-0.030*
	(0.974)	(-1.514)	(-1.471)	(-1.824)
Board independence	0.282	-0.354	1.020*	-0.252
	(0.257)	(-0.239)	(1.824)	(-0.580)
Board financial expertise	0.701	-1.055	0.577	-0.195
	(0.777)	(-0.876)	(0.735)	(-0.348)
Exposure to misconduct	2.022	-1.422	0.220	2.092***
	(1.284)	(-0.666)	(0.212)	(2.612)
Ln (Board age)	0.534**	-0.792***	0.467***	-0.453***
	(2.442)	(-2.999)	(3.166)	(-3.835)
Ln (CEO tenure)	-0.076	0.117	0.516***	-0.009
	(-0.419)	(0.491)	(5.544)	(-0.141)
CEO is chair	0.522**	-0.783***	0.349***	-0.191*
	(2.324)	(-2.739)	(2.860)	(-1.777)
Abnormal ROA		-0.193**		-0.333***
		(-2.258)		(-6.926)
Adverse stock return		0.249		0.315*
		(1.508)		(1.909)
Abnormal stock volatility		1.845**		4.030***
		(2.175)		(5.204)
Abnormal stock turnover		-0.053		-0.130**
		(-0.911)		(-2.087)
Observations	3004	3004	3004	3004
Prob>Chi^2	0.000	0.000	0.000	0.000
Log likelihood	-513	-513	-505	-505

Table A.VIII. Are our results driven by the 2008 crisis?

Odd-numbered columns report the estimated relations between *Monitoring Quality* and *Advising Quality* and the commission of misconduct (M=1), and even-numbered columns report the relations between *Monitoring Quality* and *Advising Quality* and detection, given misconduct (D=1|M=1). Standard errors are clustered at the bank level. The sample covers the period 1999–2012. Definitions of all variables are provided in Appendix 1. *t-Statistics* are reported in parentheses. ***, **, and * indicate significance at the 1, 5 and 10% level, respectively.

	P(M=1)	**P(D=1|M=1)**	**P(M=1)**	**P(D=1|M=1)**	**P(M=1)**	**P(D=1|M=1)**	**P(M=1)**	**P(D=1|M=1)**
	1999–2007				**2008–2012**			
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
Monitoring Quality	-1.042*	1.293*			-0.367*	5.278***		
	(-1.828)	(1.754)			(1.753)	(-4.440)		
Advising Quality			-0.175***	0.900***			-0.094***	0.127***
			(-2.936)	(3.664)			(-2.792)	(4.309)
Other controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1416	1416	1416	1416	1588	1588	1588	1588
Log likelihood	-109	-109	-95	-95	-349	-349	-348	-348
Prob > Chi^2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Table A.IX. Monitoring and Advising Quality for independent directors

Monitoring Quality of independent directors is the fraction of independent directors who are appointed before the current CEO. *Advising Quality of independent directors* is the number of directors to whom independent directors on the board are collectively connected, scaled by the total number of independent directors sitting on the board. Columns (1) and (3) report the estimated relations between *Monitoring Quality of independent directors* and *Advising Quality of independent directors* and the commission of misconduct (M=1), and Columns (2) and (4) report the relations between *Monitoring Quality of independent directors* and *Advising Quality of independent directors* and detection, given misconduct (D=1|M=1). Standard errors are clustered at the bank level. The sample covers the period 1999–2012. Definitions of all variables are provided in Appendix 1. *t-Statistics* are reported in parentheses. ***, **, and * indicate significance at the 1, 5 and 10% level, respectively.

	P(M=1)	**P(D=1|M=1)**	**P(M=1)**	**P(D=1|M=1)**
	(1)	**(2)**	**(3)**	**(4)**
Monitoring Quality of independent directors	-0.913***	2.119*		
	(-2.964)	(1.802)		
Advising Quality of independent directors			-0.118***	0.080***
			(-4.306)	(3.573)
Other controls	Yes	Yes	Yes	Yes
Observations	3004	3004	3004	3004
Log likelihood	-497	-497	-491	-491
Prob>Chi^2	0.000	0.000	0.000	0.000